

Amateur Radio

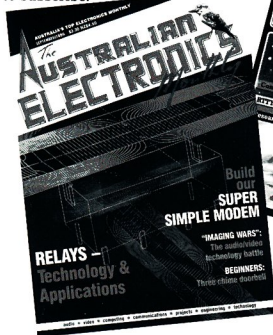
JOURNAL OF THE WIRELESS INSTITUTE OF AUSTRALIA
VOL 55, No 2, FEBRUARY 1987



- DOC MANAGER TALKS ON CHANGES AFFECTING THE ARS
- AMATEURS MAKE HISTORY ● MORSE INTERFACE
- IAMBIC TOUCH KEYS ● LEARN MORSE ON YOUR COCO2

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HAMADS should be sent direct to the same address, by the same date.

Acknowledgment may not be made unless specifically requested. All important items should be sent by Certified Mail. The Editor reserves the right to edit all material, including Letters to the Editor and Hamads, and reserves the right to refuse acceptance of any material, without specifying a reason.

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Shozo JA1AN, accepts a Ceramic Plaque from David VK3ADW. See story page 4.

Special Features

60th Anniversary Celebrations WIA represented at JARL Anniversary	4
Amateurs Make History	32
Band Plan 23cm by Ron Henderson VK1RH & Peter Gamble VK3YRP	28
Classic Communications Equipment AR-88 by Colin MacKinnon VK2DYM	20
DOC Manager Talks on Changes Affecting the ARS by Jim Linton VK3PC	22
Treasurer's Report — for 1985	5

Technical Features

Iambic Touch Keyer by Ivan Huser VK5QV	6
Learn Morse on your COCO2 by Kevin Bond, VK3CKB	27
Morse Interface by Arthur Forster VK2DKF	16
Power Supplies using Series Regulator Packages by Lloyd Butler VK5BR	10

Regular Features

Advertisers' Index	64	Education Notes —	46
ALARA	39	Electro-Magnetic Compatibility Report	36
AMSAT Australia	48	Equipment Review — Icom IC-28A 2m FM Transceiver	24
AR Showcase	49	Five-Eighth Wave	59
— Antenna Tuner by Icom	52	Forward Bias	56
— Automatic Lighting Control	51	Hamads	64
— Buffer Amplifier	51	How's DX	30
— Coaxial RF Switches by MFJ	53	International News	23
— Cross Needle MFJ Antenna Matcher	53	Intruder Watch	28
— Electromagnetic Safeguard	50	Know Your Secondhand Equipment	29
— Icom IC-751A HF Transceiver	52	Main QSP — Department of Communications	3
— Icom IC-1271A 1296 MHz Transceiver	52	Obituaries — Bob Barringer, Gordon Pearce, Pieter Van Louwersen, Geoff Clay & Allan Heath	62
— Throughput on Single-Wide Eurocard Board	51	Over to you! — members have their say	61
Awards	40	Pounding Brass	41
— Annual AR Publication Awards	39	QSP	9, 15, 18, 26, 29, 35, 38, 41, 45, 46, 53, 64
— European Community Award	40	Silent Keys — VK2HC, VK2ECA, VK2EO, VK2HF, LS0527, VK7NJL, VK5HQ, VK4PB, VK4LM, VK3ADR, VK3JY, VK6BF, VK5HW, VK3ADY	63
— Jubilee 150 Updates	40	Spotlight on SWLing	45
— Luxembourg Award	40	Stolen Equipment	64
— RL 50 Jubilee Award	40	Technical Mailbox	47
— St David's Day Award	41	VHF UHF — an expanding world	33
— Television Award of Queensland	40	VK2 Mini Bulletin	58
— WIA 75 Updates	40	VK3 VJA Notes	58
Club Corner	54	WA Bulletin	60
Contests	42	WICEN News — The Great Bike Ride	56
— French DX — Rules	44		
— John Moyle Field Day — Rules	42		
— National Sprint Results	44		
— RSGB 7 MHz SSB & CW — Rules	44		
— YL ISSB QSO Party — Rules	44		
Editor's Comment — What does the Editor actually do?	3		

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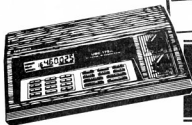
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Editor's Comment

WHAT DOES THE EDITOR ACTUALLY DO?

I write this on 30 December 1986, almost the last and certainly one of the hottest Melbourne days of the year (about 35 deg C). But we who put together your magazine are thinking ahead to the first week of February, when this issue will reach you. All the material has to be ready by 2 Jan, only about four instead of the usual six weeks ahead. February is unusual; due to the December holidays it usually has less up-to-the-minute material and is published a little late. In another 17 days we reach the March deadline, and come back to our usual six weeks lead time.

Being a holiday period, it seemed a good idea to go through the editorial file and extract from it the material which had been dealt with in 1986. Clean the slate, as it were, for 1987. I thought it might interest all of you to know what, in retrospect, had kept me busy during the year.

First, of course, there was the writing of 12 editorials. It only takes you a couple of minutes to read each one, but I can state firmly that it takes much longer to write! Inspiration is often a problem. A kick-start is usually needed. Sometimes this may be

provided by a letter recently received, or an item of news from elsewhere. Sometimes it's a long hard struggle! I'm sure you, the reader, can tell the difference, but I hope all have been worth reading. Some have stirred up the odd hornets' nest, and perhaps that hasn't always been a bad thing!

Once a year, there's the report to the Federal Convention. It takes a little while to get all the details together, but generally this is less demanding than an editorial. Even so, it's a page or two.

The Publications Committee meets 11 times a year (we have a holiday in January). Guess who's in the chair? Preliminary organising, collecting and sorting material, and making up some kind of agenda usually takes more time than the three hours or so of the meeting. This is the main interface between the Technical Editors and the producers, at which everyone finds out what everyone else has been and is doing, and more to the point, what each is going to be attending to for the next four weeks. Usually there is a little something or other for the Editor to edit too!

Then there are the letters from you, our

readers. Many go straight into the "Over to You" pages with little or no editing being necessary. Some are not intended for publication. For various reasons, some are not appropriate to publish. Some seek information, or state viewpoints which are not of general interest. All of these must receive replies. They totalled 49 in 1986, with an all-time peak of 14 replied to in November alone. This is a job for the Editor and no-one else.

Altogether, I estimate that AR requires about 20 hours of my time in an average month; in some months, over 30. I have been asked from time to time how much I am paid for all this effort. The answer is, nothing! The job is purely honorary. The WIA cannot afford to pay all who might equally demand to be paid as well as the Editor. After all, we are an AMATEUR organisation in the true sense of the word. We do appreciate the kind words many say or write to us about this, your magazine. May we and our successors continue to serve you as long as there is a hobby of Amateur Radio!

Bill Rice VK3ABP
Editor

Department of Communications

Main QSP



AMATEUR REPEATER/BEACONS — CO-ORDINATION

Over recent months it has become apparent that some misunderstanding exists within the amateur community concerning the licensing/co-ordination of amateur repeaters and beacons. I therefore feel it important that I clarify the Department's position on this matter.

At the outset I would stress that the Department is the sole licensing authority. Any decision on licence conditions applied, frequencies allocated or in fact whether or not to issue a repeater/beacon licence rests with the Department.

In order to assist the orderly development of the Amateur Service, the Department has adopted the Institute's allotment plan for the purpose of frequency allocation rather than apply its own. I am sure it is appreciated, some form of band plan is necessary to minimise interference between stations.

As you are aware, the Department had for sometime undertaken the role of co-ordinating applications for repeater/beacons with the Institute. This has proved a most time consuming process and contributed to delays in licence processing.

In light of these aspects, it is considered more appropriate for the co-ordination process to occur prior to submission of the licence application. Consequently, applicants for amateur repeater/beacons will in future be required to submit a letter from the Institute together with their application. The Department will then assess the application and comments provided by the Institute as part of the decision making process.

I would mention that the Institute's role in the co-ordination process should be restricted:

- advising the applicant on:
 - inconsistencies with the band plans or existing amateur frequency allocations;
 - technical matters relating to system configuration;
- acting as a conciliator between affiliated clubs where conflicts arise; and
- providing relevant comment to the Department.

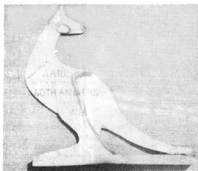
Repeater/beacons can be a valuable asset to the amateur fraternity as a whole. It is important to recognise in this regard that repeaters are available for the use by all amateurs. Similarly, it should be recognised that some form of co-ordination process is necessary to ensure that optimum use is made of the spectrum available for amateur operations.

I trust that this letter clarifies the situation in relation to repeater/beacon co-ordination and would appreciate if the Institute could disseminate the information outlined to the amateur community.

Yours sincerely

D Hunt
Manager Regulatory
Operations Branch
Radio Frequency Management Division
Canberra

10 December 1986



On special invitation by JARL, the Wireless Institute of Australia was represented at the 60th Anniversary Celebrations of JARL, by the WIA President, David Wardlaw VK3ADW.

The main celebrations were spread over a number of days commencing with a dinner hosted by Directors of the JARL.

At this dinner the President of the WIA presented the President of JARL, Shozo Hara JA1AN, with a ceramic plaque in the form of a kangaroo.

The plaque was in recognition of the JARL's 60th Anniversary. On Saturday, November 8, a ceremony commemorating the 60th Anniversary of JARL was held at the hotel *Okura*, at which Mr Shunjiro Karajawa, the Minister of Post and Telecommunications and Dick Baldwin W1RU, IARU President, who also attended the WIA 75th Anniversary Celebrations, addressed their messages of congratulations.

A film *The Record of the Amateur Satellite — Fuji* was shown. Fuji has created a great interest in amateur satellite communication in Japan. Also attending the celebrations were Terry Carrell ZL3QL, President of NZART and 'Jumbo' Godfrey ZL1HV, a past-Director of the Region 3 Association, both of whom have attended WIA Federal Conventions.

Cover Story — 60th Anniversary Celebrations

Michael Owen VK3KI and Fred Johnson ZL2AMJ, represented the Region 3 Association.

The ARRL, DARC (Germany), RAST (Thailand), CRSA (The Peoples Republic of China), the Taiwan Society and RES (France) were represented.

A chance was given to visit two of the major manufacturers of amateur equipment and discussions took place on the problems of the value of the Yen and their attempts to combat its effect on their exports.

One afternoon was given over to a discussion of amateur radio activities throughout the world with various societies comparing their percentage level of membership. It seems that the larger the society, the less the percentage of total amateurs are members.

One notable exception is the DARC, which has a very high percentage. We also learned that the common licence is gaining ground in Europe. The need for very low cost equipment for amateurs in developing countries was emphasised.

Talks were held with the CRSA (The Chinese Radio Sports Association — Peoples Republic of China) concerning matters of joint CRSA/WIA co-operation on an educational project.

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TREASURER'S REPORT

I normally arrange for the publication of audited figures for Federal Income and Expenditure for the WIA to be placed in *Amateur Radio* well before now. It appeared early in 1985 that the Federal body could be liable for taxation as it was being argued as noted by various sections of "the act" we were a profit making concern and earning interest on our surplus funds during the year. The WIA may have faced a tax bill of \$20000 to \$30000 or more depending on how far the Taxation Commissioner was prepared to go back in time into our books and, more importantly, what fines he could have levied. After many months of skilful negotiations by our legal advisors, we received an exemption in writing from the Commissioner of Taxation.

Main audited income and expenditure for December 31, 1985, were:

BUDGET	ACTUAL	
\$230 000	\$232 000	(Income)
\$129 000	\$137 000	(Expenditure)
\$100 000	\$ 96 000	(AR Magazine)

We made a loss for this year of \$1000.

At the Federal Convention in April 1986, I presented a six page report which goes into detail on the above figures.

I do not propose to go into detail on my report here, but any interested member may obtain it by writing to the Federal Office.

The charts accompanying this report give a breakdown of our financial affairs.

ABRIDGED BALANCE SHEET as at December 31, 1985

Deferred Asset	\$ 6000	Debuture due February 1987
Current Assets	\$153000	Deposits \$134 000 remainder spread
Fixed Assets	\$33000	Office Equipment, furniture (was \$53 000, depreciated by \$20 000) eg computer

\$192000

Current Liabilities \$120000

Subscriptions in advance \$77 000, Creditors \$20 000, Amounts payable to State Divisions \$15 000, remainder spread

Members Funds \$ 72000

WORKING CAPITAL

Current Assets \$153000
less Current Liabilities \$120000

\$33000

As our accounts for payment approximate \$20/30 000 per month, this is a satisfactory figure.

Should any member be interested in a full breakdown of the Audited Balance Sheet it can also be made available upon written request to the Federal Office.

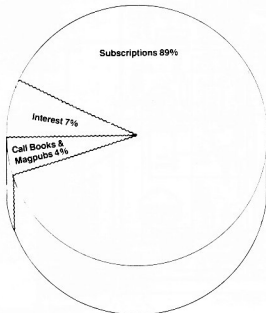
I believe a satisfactory financial position should occur for December 31, 1986, however, in 1987, I foresee the possibility of cost pressures further eroding into any surpluses that may accrue on our various incomes.

If our membership remains at approximately its present figure with increase in Federal Element of \$2.50 per member, now in effect, we still may not be able to cut square for that year. Therefore, a very close watch on our finances for 1987 will be paramount, and if required, it may be necessary to reduce those services provided by the Federal Body — if membership drops and/or significant cost increases occur — eg further fall in \$A, wages and general increase in inflation will also necessitate a review of present services. If the foregoing comes to fruition, the only other alternative to keeping up the status-quo on our services will be to increase subscriptions in order to come up with a balanced budget.

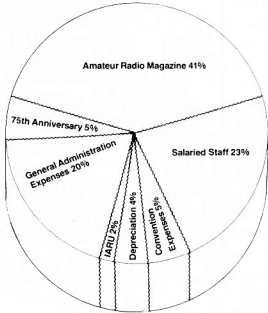
Best wishes to all.

73 Ross Burstall VK3CRB
Honorary Federal Treasurer

INCOME



EXPENDITURE

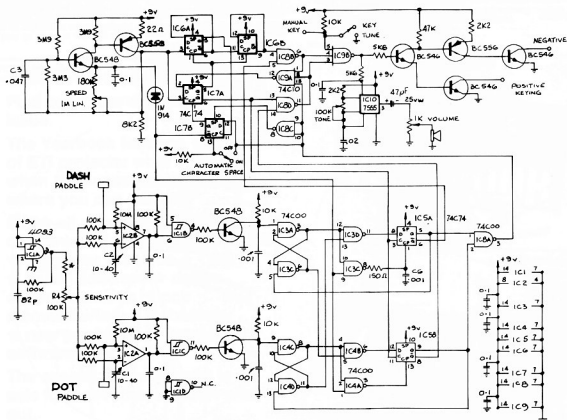
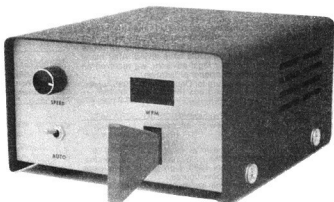


Iambic Touch Keyer

Ivan Huser VK5QV

7 Bond Street, Mount Gambier, SA. 5290

This keyer may be constructed as a "stand-alone" unit or the touch section only built as an "add-on" to an existing keyer.



The result is a keyer that is very light to the touch and a real dream to use. Having no moving parts, the keyer has no inertia and is absolutely mechanically silent. And, of course, there are no contacts to maintain either. On the negative side, the keyer may take a little getting used to — for instance, not resting the fingers on the paddle when sending.

Capacitive coupling to the operator's hand unbalances the inputs to the respective comparator and initiates the keying action. Cor-

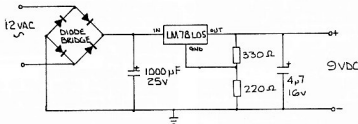


Figure 2 — Regulated Supply.

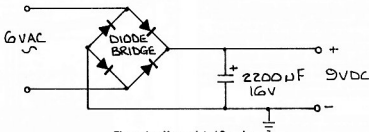
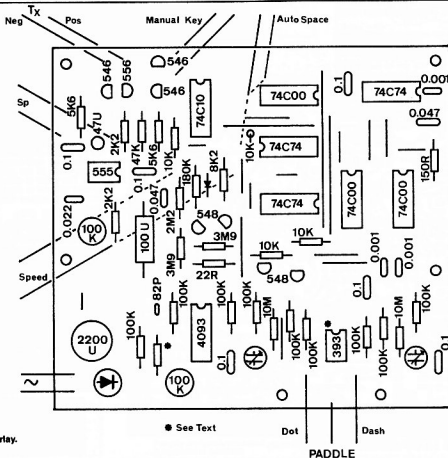


Figure 1 — Unregulated Supply.



rectly adjusted, the keyer is extremely sensitive. With the sensitivity control set at maximum, the keyer will operate with the fingers about 10 mm from the paddle. This, of course, is far too sensitive for normal operation.

The outputs from the comparators are cleaned up by Schmitt triggers ahead of the keyer logic to produce a positive switching action.

With the exception of the output keying stage, no changes have been made to the *Accu-Keyer* circuit and the same facilities such as automatic character spacing and side tone are still available as desired.

The modified keying stage will key either negative or positive voltages up to about 100 volts at a current of around 100 mA and should be compatible with most modern transceivers. The choice of negative or positive keying is made by selecting the appropriate pin on the printed circuit board.

The current drain is low and the whole thing can be powered from a small nine volt battery. However, provision has been made on the printed circuit board for either an unregulated or regulated mains powered supply. The regulated supply is recommended if a LED speed readout is permanently connected.

COMPONENTS

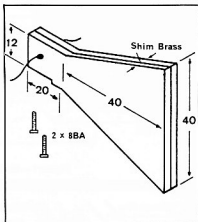
All components should be readily available with perhaps the exception of the LM393. The LM393 is a low offset dual comparator and if not available, a dual operational amplifier such as the LM358 or MC1458 may be substituted with some reduction in sensitivity and circuit performance.

Resistors are quarter-watt types and the tone and sensitivity controls (if mounted on the PCB) are horizontal cermet type trim pots.

Capacitors up to and including the 0.1 μ F may be disc ceramic or greencaps and the 47 μ F, an electrolytic or tantalum. The two balance trimmer capacitors should be of a type that is stable and easily adjusted. The printed circuit board will accommodate most currently available trimmers and no problems should be encountered here.

CONSTRUCTION

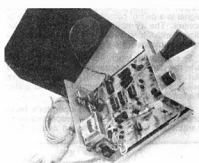
The touch sensitive section must be constructed so that it can be fully balanced and a PCB pattern and component overlay is given as an aid to construction. The board layout has been arranged such that the touch section only can be reproduced if so desired.



Paddle Details.

The size of the printed circuit board has been selected to allow the keyer to be housed in one of the popular metal utility boxes and a suggested front panel layout is given as a starting point. I opted to bring the speed control and automatic character space switch out to the front panel. The sensitivity and tone pots are mounted on the PCB. Other controls can be brought out to the rear panel. The window above the paddle cutout is for a future speed readout. Normal individual likes and dislikes will, of course, dictate the final layout.

The original paddle was constructed using three millimetre bakelite and 0.05 mm shim brass although perspex and tin plate could also be used. The paddle should be assembled using high quality contact adhesive and then dipped in a plastic such as *Redskin* to seal it from moisture and give it a near professional appearance.



ADJUSTMENT

Adjustment of the touch sensitive circuit is quite straightforward.

Slowly advance the sensitivity control until one side (dit or dah) operates spontaneously. Adjust the appropriate trimmer capacitor until the operation stops. Further advance the sensitivity control in steps and adjust the respective trimmer capacitor until the characteristic di-dah iambic output is spontaneously obtained.

Select the resistor marked with an asterisk on the circuit diagram and component overlay so that the spontaneous iambic operation occurs close to the point of maximum sensitivity. The value of resistance should finish up around 12k and in any case, would be a good starting point when making the initial adjustment.

For normal operation, the final setting of the sensitivity control should be such that the keyer operates just as the fingers touch the paddle but will depend to some extent on the "feel" of the operator.

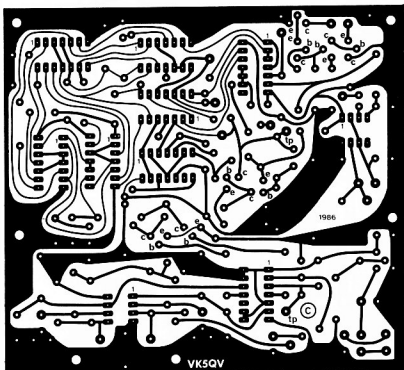
FINALE

I first constructed the touch section of the keyer on a breadboard using double sided PCB for the paddle and was so impressed with the result that I went ahead and built the complete keyer as described. My home-brew copy of a well-known and very expensive mechanical iambic paddle has now been retired in favour of the touch keyer.

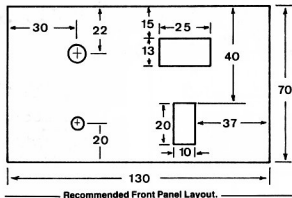
Good luck with the project.

COMPONENT LIST

Resistors	Semiconductors
1 ... 22R	1 ... 4093
1 ... 150R	1 ... LM393*
2 ... 2k2	1 ... 7555 (555)
2 ... 5k6	3 ... 74C00
1 ... 8k2	3 ... 74C74
4 ... 10k	1 ... 74C10
1 ... 12k*	3 ... BC548
1 ... 47k	1 ... BC558



Printed Circuit Board. (Full size).



- 9...100k
- 1...180k
- 1...2M2
- 2...3M9
- 2...10M

- 3...BC546
- 1...BC556
- 1...1N914

Variable Resistors*

- 1...1k lin
- 2...100k lin
- 1...1M lin

Capacitors

- 1...82p ceramic
- 3...0.001 greencap
- 1...0.022 greencap
- 1...0.047 greencap
- 6...0.1 ceramic
- 1...47µ tantalum

Sundries

Printed Circuit Board,
Speaker, Switches,
Utility Box, etc.

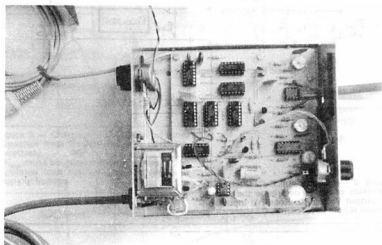
Variable Capacitors

- 2...10-40 pF trimmers

*See text.

NOTES

- 1 Electronic Morse Code Keyer, *Electronics Australia*, March 1978.
- 2 The Accu-Keyer, *ARRL Handbook*.
- 3 An Ash Proof Keyer Paddle, *QST*, Date unknown.



SINCERE APPRECIATION

On behalf of the Girl Guides Association of Australia, I would like to convey to members of the Wireless Institute of Australia, our sincere appreciation for members assistance at the 29th Jamboree on the Air.

In their reports, leaders expressed their thanks for the wonderful way in which their operators helped to make the weekend a success.

Yours sincerely,

June Retallack
National Guide JOTA Liaison

SATELLITE RECEIVE ONLY DISHES

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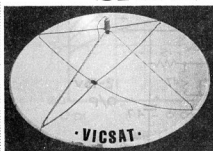
- 1.40m Offset feed Ku Band
- 1.80m Prime Focus Ku Band
- 2.65m Prime Focus Ku Band
- 3.00m Prime Focus Ku Band
- 3.30m Prime Focus C Band

Various mounts available for all dishes which are assembled and tested to meet the stringent Ku Band specifications before shipment.

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Power Supplies using Series Regulator Packages

Lloyd Butler VK5BR
18 Ottawa Avenue, Panorama, SA. 5041

A design procedure is outlined for low voltage supplies with loads up to 10 amps.

Because complete voltage regulator packages are readily available in current ratings up to 10 amps, the assembly of a low voltage supply for load currents in this range is a relatively easy task. Notwithstanding this, before proceeding with the task, a number of important circuit details must be worked out so that suitable components can be selected to work in conjunction with the regulator package. Such details include the following:

- The transformer secondary voltage and load current rating
- The size of the reservoir capacitor
- The maximum power dissipation in the regulator and rectifier units
- The size of the heat sinks
- Surge current into the rectifier unit

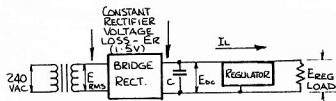
Other considerations include the careful placement of bypass capacitors to prevent instability of the regulator or RF getting back into the regulator from a transmitter load and the need for protection diodes to protect the regulator in the event of a short circuit.

The intention of this article is to discuss the general aspects of the regulated power supply design. However, to assist in the discussion, the development of a sample power supply to deliver 13 volts at a maximum load of 10 amps will be considered. A suitable voltage regulator

for this purpose is the LM396, which can regulate for an output voltage range of 1.25 volts to 15 volts at a load current up to 10 amps and dissipate power up to 70 watts. A power supply envisaged is illustrated in Figure 1.

CIRCUIT R-C CONSTANTS

The DC power supply can be resolved into three components as shown in Figure 2, the source resistance (R_s), the filter capacitance (C), and the load resistance (R_L).



Basic Rect-Filter-Regulator Circuit.

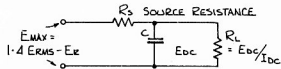


Figure 2 — Equivalent R-C Circuit, the Constants of which determine the ratio of DC Output Voltage to Rectified Input Voltage and Ripple Level across C.

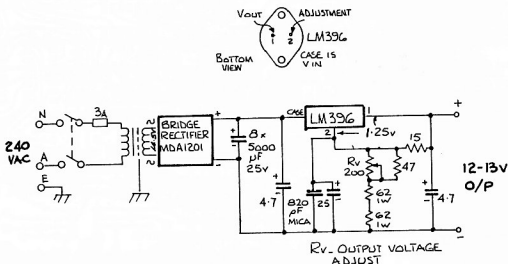


Figure 1 — 12-13 volt, 10 amp Power Supply.

The source resistance (R_s) includes rectifier resistance and transformer loss resistance. However, voltage loss in a silicon rectifier is substantially constant over most of its load range and hence the source resistance is essentially that resistance caused by the transformer core and winding losses. For the silicon bridge rectifier, two diodes conduct in series during each half cycle and voltage loss is about 1.5 volts. To calculate the effective source peak DC voltage (E_{sdc}), we simply subtract 1.5 volts from the transformer secondary peak AC voltage.

Load resistance (R_L) is the average DC voltage (E_{dc}) developed across capacitance (C) divided by the maximum DC load current (I_L).

The DC voltage developed across C is a function of the charge time constant $R_s C$ and the discharge time constant $C R_L$ and as illustrated in Figure 3, includes a ripple component caused by the charging and discharging process. The voltage regulator which follows acts as a second stage ripple filter and if it is to work correctly, the voltage trough (E_{min}), caused by the ripple, must not be less than the sum of the regulated output voltage and the regulated drop-out voltage.

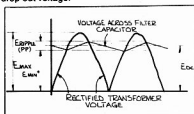


Figure 3 — Charge and Discharge of Filter Capacitor from Source and into Load Respectively.

* E_{min} must be greater than the sum of the regulated load voltage and the regulator drop out voltage.

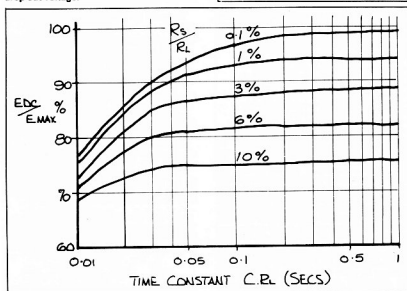


Figure 4 — Ratio of Average DC Voltage across C to Peak Rectified Voltage as a Function of Time Constant $C R_L$ for Full Wave Rectifier.

Figure 4 shows the ratio E_{dc} / E_{max} as a function of time constant $C R_L$ for various ratios of R_s to R_L . These curves have been derived

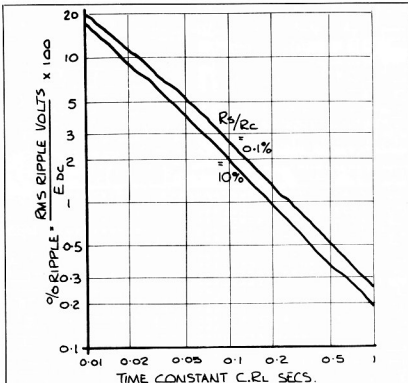
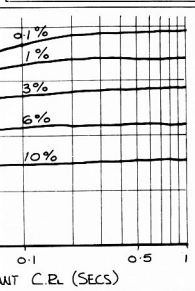


Figure 5 — Percentage Ripple as a Function of Time Constant ($C R_L$) for Full Wave Rectifier.



from more comprehensive curves originally developed by Shade, Proc IRE Vol 31, 1943 and republished in a number of other reference sources. From the curves, it can be seen that to obtain high developed voltage, R_s must be as low as possible and time constant $C R_L$ must be not less than 0.05 second. We now examine a second set of curves, Figure 5, which plot

ripple percent as a function of time constant $C R_L$ for a range of ratios R_s / R_L . We see that R_s affects the ripple a minor amount and that for time constants ($C R_L$) of 0.05 to 0.1 second, ripple percent is around 2 to 4 percent, hence trough (E_{min}) is very close to E_{dc} . From the two diagrams, we can also see that there is little to be gained by using time constants above 0.1 second.

A time constant $C R_L$ lower than 0.05 second can be used but more transformer secondary voltage would be required to obtain a value of E_{min} necessary to prevent regulator cut-off. Another disadvantage is that, with the higher ripple level and a greater ratio of E_{dc} to E_{min} , the voltage differential across the regulator must be higher and hence a higher regulator power dissipation. In essence, what is saved in filter capacitance is lost in the need for a larger heat sink.

A time constant $C R_L = 0.07$ second seems to be a good choice for the average case.

REGULATOR INPUT VOLTAGE

On the basis of our previous discussions and allowing five percent for mains voltage variation and the ripple trough, we can set the value of E_{dc} as follows:

$$E_{dc} = 1.05 (E_s - E_{dc})$$

where E_L is the load voltage

and E_{dc} is the regulator drop-out voltage.

Considering our load sample of 13 volts at 10 amps and our LM396 regulator, we can work out E_{dc} for that case. The drop out voltage of the LM396 is given as a typical 2.1 volts, but could be as high as 2.75 volts. Using the 2.75 volts, we get:

$$E_{dc} = 1.05(13 + 2.75) = 16.5 \text{ volts.}$$

Unless you are worried about the mains voltage falling further, there is little point in allowing more margin as this means more power which must be dissipated in the regulator.

CAPACITANCE (C)

From our previous discussion on the time constant of C_R , let us decide to use a time constant of 0.07 second. Our ripple voltage will be about three percent and our average voltage across C (E_{DC}) will be within 1.5 percent of E_{max} . Load resistance is calculated as follows:

$$R_L = \frac{E_{DC}}{I_L} = \frac{16.5}{10} = 1.65 \text{ ohms}$$

Capacitance C is then calculated from:

$$C = \frac{T}{R_L} = \frac{0.07 \times 10^6}{1.65} \text{ microfarads}$$

where T = time constant C_R

ie, $C = 42,400 \text{ mfd}$ (say 40,000 mfd).

This is a large capacitance which can be built up, if necessary, from paralleled smaller values. Voltage rating must be not less than 1.4 x E_{max} . (The transformer secondary voltage to be calculated later).

RECTIFIER RATING

To proceed further with selecting the transformer secondary voltage based on the curves of Figure 4, we need to know the value of R_L . However, before looking at this, we must examine the rectifier bridge and how it is also affected by the value of R_L .

Rectifier ratings which must be considered are as follows:

- 1 The maximum average current rating (I_L) to be not less than the maximum load current (I_L).
- 2 The peak inverse voltage rating (V_{max}) must be not less than 2.8 E_{max} (twice the peak secondary voltage) plus a safety margin up to 50 percent higher to allow for line transients.
- 3 The surge current rating (I_{sur}) in relation to source resistance (R_s) — to be discussed further.

The maximum instantaneous surge current, on switch on, is equal to $(1.4 E_{max} - 1.5) / R_L$ and this flows to charge C . The peak voltage is reduced by 1.5 because of the voltage loss in the bridge itself.

Suppose we select rectifier bridge type MDA1201 for our sample supply. This has a maximum average current rating of 12 amps and a peak inverse voltage rating of 100 volts, more than sufficient for our 13 volts, 10 amps power supply. The I_{sur} rating of the bridge is 400 amps.

Referring back to Figure 4, we can expect the average DC voltage (E_{DC}) to be as low as 85 percent of the peak value, hence the rectifier surge current sourced from the transformer primary, could be as high as $E_{DC} / 0.85 R_L$. Transposing the formula we could say, that to safeguard the rectifier bridge, R_s must be not less than $E_{DC} / 0.85 I_{sur}$. Applying this to our power supply, minimum source resistance (R_{sm}) is calculated as follows:

$$R_{sm} = \frac{E_{DC}}{0.85 I_{sur}} = \frac{16.5}{0.85 \times 400} = 0.05 \text{ ohm}$$

Now R_L was calculated previously as 1.65 ohms, hence the lowest ratio of R_s/R_L possible is $0.05/1.65 = 3$ percent which we will refer to later.

Another requirement of the I_{sur} rating is that the surge should not be sustained and the time constant $R_s C$ should not be greater than one half AC cycle (often quoted as 8.3 msec for a 60

Hz supply). In the case of our supply, $R_s C = 0.05 \times 40,000/1000 \text{ msec} = 2 \text{ msec}$ and no problem.

THE TRANSFORMER

The problem with the transformer is that until it is obtained, its source resistance (R_s) is an unknown factor, which in turn, affects the choice of its secondary voltage. At this stage we might assume that it has the minimum source resistance required to limit the rectifier surge current, as previously calculated, and therefore has the ratio $R_s/R_L = 3$ percent. Referring back to Figure 4, for a time constant $C_R = 0.07$ second and $R_s/R_L = 3$ percent, ratio $E_{DC}/E_{max} = 87$ percent. We can now calculate our first estimate of secondary RMS voltage as follows:

$$E_{rms} = 0.7 (E_{DC}/0.87 + 1.5) \\ = 0.7 (16.5/0.87 + 1.5) \\ = 14.3 \text{ volts.}$$

Secondary current rating is equal to 1.4 I_L and for our sample supply, 14 amps. Power rating of the transformer is $E_{rms} I_{rms}$, which is $14.3 \times 14 = 200$ watts.

At this stage, a few words might be said about the cost of the transformer. A 200 watt transformer can be an expensive item and if the building of such a large supply is contemplated, a search for a transformer from some old equipment is well worthwhile. Transformers from old black and white television sets can be put to good use. These transformers are usually rated about 200 watts and would be good for higher powers in amateur radio intermittent load applications. Heater windings on these transformers have heavy gauge wire and it is possible to achieve enough voltage for a 13 volt DC supply by series connection of some of these windings. The writer was able to obtain sufficient voltage on a similar supply by series connection of two 6.3 volt windings and tapping down the mains primary connection.

If the secondary has to be rewound, carefully remove the old outer windings and count the turns to obtain the number of turns per volt used. As a guide to winding wire selection, 1000 circular mils-per-amp is a conservative rating, but the ARRL Handbook suggests 700 circular mils-per-amp as common for amateur intermittent service. On this basis, suggested wire gauges are as follows:

1 amp	22 SWG
2 amp	20 SWG
3 amp	18 SWG
6 amp	16 SWG
9 amp	14 SWG
12 amp	13 SWG
16 amp	12 SWG

If you are using the power supply to operate a single sideband transmitter, you might be able to get away with an even smaller gauge than these. Whilst the voltage regulator must be rated for maximum current swing, the transformer heating is dependent on average current through its windings. You should check your transmitter average load current under speech conditions as you might find you can down-grade the power rating of the transformer considerably.

Having obtained a transformer, or rewound one, or whatever, we are still in the position where we are guessing about the value of source resistance (R_s). What we can do is to measure its value as shown in Figure 6. Here the difference is measured between the secondary voltage unloaded and the secondary voltage loaded with a large current. Some form of dummy load, such as a network of high wattage resistors, is needed for this test.

Source Resistance (R_s) =

$$\frac{(V_{no-load} - V_{load}) R_{load}}{V_{load}}$$

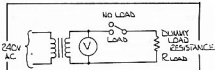


Figure 6 — Measurement of Source Resistance (R_s).

Source Resistance (R_s) =

$$\frac{(V_{no-load} - V_{load}) R_{load}}{V_{load}}$$

If R_s turns out to be less than that required to protect the rectifier, resistance should be added in series with the secondary winding or the rectifier bridge output to build up R_s to the protection value. If this is the case, the initial calculation for the transformer secondary RMS voltage is correct. If R_s is more than this value, ratio R_s/R_L is recalculated, a new ratio of E_{DC}/E_{max} percent is read from Figure 4 and a new value of RMS secondary voltage is calculated as follows:

$$E_{rms} = 0.7 (E_{DC}/R_s + 1.5) \\ \text{where } R_s = \frac{0.7 (E_{DC}/R_s + 1.5)}{E_{DC}/100 E_{max}}$$

This, of course means a probable addition of more turns to the secondary winding.

A less harassing procedure might be to make the transformer secondary with a little higher voltage to start with and if E_{DC} turns out to be higher than required, add resistance in series with the secondary, or the rectifier, so that R_s is increased to lower E_{DC} to the desired value. Again, it is emphasised that if E_{DC} is higher than necessary, there is unnecessary heat dissipation in the voltage regulator.

HEAT SINKING

To control the junction temperature of the voltage regulator within its rated specification, an effective heat sink is required. Where large currents are involved, the rectifier bridge also requires heat sinking.

To choose the heat sink, the following data is needed:

- Maximum power dissipation in the device (P_d)
- Maximum rated temperature of the device junction (T_J)
- Thermal resistance of the device junction to device case (R_{JC})
- Thermal resistance of the device case to heat sink (R_{JA}); ie the device insulating washer
- Maximum ambient temperature in which the device and heat sink must operate (T_A)

Thermal resistance between two points is the rise in the temperature per watt dissipated ($^{\circ}\text{C}/\text{W}$).

Thermal resistance of the heat sink to air is R_{JA} and the total thermal resistance, junction to air (R_{JA}) is the sum of the other resistances in the heat dissipating chain.

$$\text{ie } R_{JA} = R_{JC} + R_{JA} + R_{JA}$$

To find the required thermal resistance of the heat sink and subsequently to choose its size, its thermal resistance is calculated as follows:

$$R_{JA} = \frac{T_J - T_A - R_{JC} - R_{JA}}{P_d}$$

T_J and R_{JC} are obtained from the device data. The value of T_A is dependent on the environment of operation. In the comfort of the radio shack, 40 degrees Celsius could be adequate but this might have to be raised if the heat sink is located where there is restricted air flow or localised air heated by other equipment. In the boot of a motor vehicle on a hot day, ambient temperature could be as high as 65 to 70 degrees Celsius.

The importance of selecting a suitable insulating washer for the device is emphasised, particularly where high dissipation powers are involved (say over 10 watts). A colleague of the writer, who had some heat sink problems, carried out some tests to measure the thermal resistance of various T03 type case insulating washers, which were at hand. The results were as follows:

No washer with silicone compound 0.062 °C/W
Beryllium Oxide 0.096 °C/W
Mica 0.16 °C/W
Silicone Rubber Fibreglass Composite
(a) without silicone compound 0.58 °C/W
(b) with silicone compound 0.27 °C/W

For low dissipation power (say 10 watts), the type of washer is of little consequence, however if large powers were involved (say 70 watts), the silicone rubber composite, without silicone compound, would develop a temperature differential of $70 \times 0.58 = 40.6$ degrees compared to only $70 \times 0.096 = 6.7$ degrees for the Beryllium Oxide washer.

No insulating washer gives the lowest temperature differential, but this means the heat sink must be electrically above ground potential with possible hazardous consequences in the event of a short circuit to ground. Also, in this case, the heat sink is isolated from the chassis which means that the chassis itself cannot assist in dissipating the heat.

The best washers are Beryllium Oxide although there is often some hesitance to use these because if the material is machined, the fine dust from machining is toxic. In its solid state the material is apparently quite safe, but the moral is not to machine it.

Referring back to our sample power supply of 13 volts at 10 amps, the power dissipation in the regulator is calculated as follows:

$$P_w = (E_{oc} - E_c) I_L$$

where $(E_{oc} - E_c)$ represents the voltage loss across the voltage regulator and I_L is the load current.

$$\text{ie } P_w = (16.5 - 13) \times 10 \\ = 35 \text{ watts}$$

Allowing a margin of 10 percent, we will assume a maximum dissipation of $35 \times 1.1 = 39$ watts. The maximum junction temperature of the LM396 is given as 175 degrees Celsius and the maximum thermal resistance junction to case (R_{jc}) is given as 1.2 °C/W.

Let us assume that a mica washer is used, as this might be easier to obtain than the Beryllium washer. Depending on the thickness, this could have a thermal resistance as high as 0.50 °C/W. The maximum ambient temperature (T_a) will be assumed to be 40 degrees Celsius.

From the preceding data, the maximum thermal resistance of the heat sink is then calculated as follows:

$$R_{sa} = \frac{175 - 40}{39} - 0.5 - 1.2 \\ = 1.76 \text{ °C/W}$$

A diagram of the heat gradient which results is shown in Figure 7. Note that the maximum temperature rise in the heat sink is $39 \text{ W} \times 1.76$ °C/W = 69°.

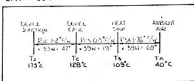
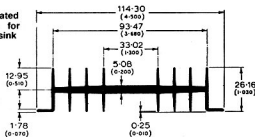


Figure 7 — Temperature Gradient Worst Conditions.

The next step is to examine some heat sink curves for commercial heat sink material which

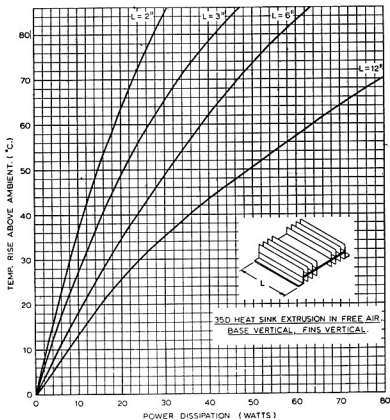
Figure 8 — Power Dissipation Tabulated against Temperature Rise for Various Lengths of 3SD Heat Sink Extrusion.



Dimensions in mm.

Inch conversions in brackets.

Scale 1:2



could be available. Typical curves for the Mullard 3SD material is shown in Figure 8. Examination of these curves indicates that the minimum length of this material to limit the temperature rise to 69° for a dissipation of 39 watts, is about five inches. Of course, we do not have to use this particular material and some other material might be available on the secondhand market from redundant equipment.

Whilst special heat sinks are necessary for large dissipation powers, lower powers (say 10 watts) can often be satisfactorily dissipated by mounting the device directly on the case of the equipment. Figure 9 gives a guide to the surface area of metal given a power dissipation and temperature differential above ambient value. As an example from the curves, 10 watts will raise the temperature of 50 square-inches to 45 degrees Celsius above ambient

temperature. That is, it has a thermal resistance of 4.5 °C/W.

The performance of heat transfer can be checked by monitoring the device case and the heat sink with a temperature probe. This sort of test equipment is not generally found around the radio amateur's shack, but is very useful if one can be borrowed. A rough idea of the performance can be judged by hand. If the heat sink feels too hot, it probably is! If the device case is much hotter than the heat sink, a better insulating washer could be indicated.

The heat sink should be mounted in a place where air-flow is free and the fins of the heat sink should be positioned in the vertical plane to aid air-flow. A blackened heat sink radiates heat more effectively than an unblackened one. Heat dissipation from the heat sink can be made more effective by forced air cooling, that is, its effective thermal resistance is lowered.

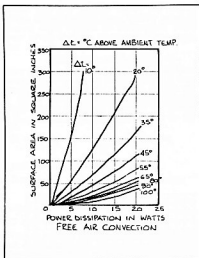


Figure 9 — Temperature Rise versus Power Dissipation for a Plane Heat Sink.

THE RECTIFIER SINK

Whilst on the subject of heat sinks, we must not forget the rectifier bridge, which in the sample supply, must dissipate 1.5 volts at 10 amps = 15 watts.

The MDA1201 is rated at a maximum junction temperature of 175 degrees Celsius and a maximum case temperature of 100 degrees Celsius at its maximum current rating (I_o) of 12 amps. From this, we calculate junction to case thermal resistance as follows:

$$R_{jc} = \frac{T_j - T_c}{P_{jc}} \\ = \frac{175 - 100}{1.5 \times 10} = 4.17 \text{ } ^\circ\text{C/W}$$

The rectifier bridge case does not have to be insulated so we give the case to sink thermal resistance (R_{cs}) a value of 0.1.

Using a previous formula for the thermal resistance of heat sink to air:

$$R_{sa} = \frac{T_j - T_a}{P_{ja}} - R_{cs} - R_{jc} \\ = \frac{175 - 40}{15} - 0.1 - 4.17 \\ = 4.73 \text{ } ^\circ\text{C/W}$$

This means a temperature rise of $15 \times 4.73 = 71^\circ\text{C}$ in the heat sink, as a maximum. Referring to Figure 9, we require a plane heat sink of not less than 30 square inches. Direct mounting of the rectifier bridge on the power supply chassis is usually sufficient to satisfy this requirement.

A few final remarks should be said about mounting semiconductor devices on the heat sink. Care should be taken to ensure that the mounting surface is flat and smooth, so that it makes good thermal contact. Make sure there are no drilling burrs to prevent complete surface contact and which could puncture the insulating washer and hence bridge the insulation. Use silicone grease or other heat sink compound on the joint to improve heat transfer.

REFERENCE VOLTAGE

Voltage regulator packages are generally three terminal devices with an input, an output and a voltage reference terminal. In fixed voltage regulators, the reference pin is connected to the common power rail. In adjustable

regulators, such as the LM396, a resistive voltage divider is required to divide the load voltage down to reference level (V_{REF}) as specified for the regulator. In the case of the LM396, the reference voltage is 1.25 volts and Figure 1 illustrates a divider network which allows an output voltage adjustment between 12 and 13 volts.

In selecting resistance values for the divider network, the bleed current through the network is made large compared to the input current of the reference pin (at least 10 times). Referring to Figure 10, a little exercise in ohms law gives us the following:

$$R_1 < \frac{E_{REF}}{10 I_{REF}} \\ R_2 = \frac{(E_o - E_{REF}) R_1}{E_{REF}}$$

The power in each resistor is also calculated so that the correct rated resistor can be selected:

$$\text{Power in } R_1 = \frac{(E_{REF})^2}{R_1}$$

$$\text{Power in } R_2 = \frac{(E_o - E_{REF})^2}{R_2}$$

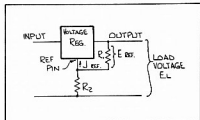


Figure 10 — Voltage Divider to set Output Voltage.

$$R_1 < \frac{E_{REF}}{10 I_{REF}} \\ R_2 = \frac{(E_o - E_{REF}) R_1}{V_{REF}}$$

VARIABLE VOLTAGE SUPPLIES

Resistors R_1 and R_2 can be replaced with a variable resistance network including a control to vary the output voltage. Suppose in our sample supply we arranged for a control to give a variable supply from 11 to 15 volts. Input voltage E_{DC} is calculated on the basis of the maximum output volts (15V), however, heat sink requirements must be based on the lowest voltage (11V), when dissipation across the regulator is greatest.

Assuming the regulator is to supply a maximum of 10 amps over the whole output voltage range, we calculate the following:

$$E_{DC} = E_{MAX} + 1.1 E_{DO} \\ = 15 + 1.1 \times 2.75 \\ = 18.03 \text{ volts.}$$

Maximum power dissipation is calculated as follows:

$$P_m = (E_{DC} - E_{MIN}) I_o \\ = (18.03 - 11) \times 10 = 70.3 \text{ watts.}$$

Now, this happens to be as far as we can go for the lowest voltage because the LM396 has a power limit of 70 watts. If we tried to go lower than 11 volts with the value of E_{DC} set to allow a maximum output of 15 volts, the dissipation in the LM396 would exceed its 70 watts rating.

Clearly, the maximum power dissipation is much greater in a variable voltage power

supply than one set for a fixed voltage and as can be seen from the example, care must be taken in design to ensure that the regulator maximum ratings are not exceeded. For the example, a low thermal resistance insulating washer, such as Beryllium Oxide is assumed, and, assuming a value of $R_{cs} = 0.1 \text{ } ^\circ\text{C/W}$, we get the following:

$$R_{sa} = \frac{T_j - T_a}{P_{ja}} - R_{cs} - R_{jc} \\ = \frac{175 - 40}{70} - 0.1 - 1.2 \\ = 0.63 \text{ } ^\circ\text{C/W} \quad (\text{ie } 44^\circ\text{ rise for } 70\text{W})$$

For this application, quite a large heat sink is required. Referring to Figure 11, about nine inches of Mullard 50D heat sink would be required.

One way this high dissipation can be avoided, over a wide output voltage range, is to divide into several ranges with switching to change the transformer secondary taps with range change.

BYPASS CAPACITORS

Small bypass capacitors, from the reference pin to common and the output pin to common, are generally required to prevent instability in the regulator. Capacitors which have low impedance at high frequencies, such as tantalums, are necessary and these should be connected with short leads right at the pins of the regulator. If the regulator is used for powering a radio transmitter, the bypass capacitors also prevent RF signals from getting into the control pin of the regulator and being rectified. The writer had one experience with a UA78HCA regulator which supplied 12 volts to a two metre transceiver. On resistive dummy load, the regulator worked perfectly but dropped its voltage when powering the transmitter. The problem was fixed by bypass capacitors, but only after a good quality mica capacitor was selected for the reference pin.

PROTECTION DIODES

When capacitors are used in conjunction with IC regulators, it is sometimes necessary to add protection diodes to prevent the capacitors from discharging through the low current points in the regulator.

When a capacitor is connected across the output of the regulator and the input is short circuited, the output capacitance will discharge into the output of the regulator and, depending on circuit constants, can possibly damage the regulator.

Another possibility is when a capacitor is connected at the reference or adjustment pin. In this case, a short circuit at either input or output pin can cause a discharge to a low current junction in the regulator. A diode connected between the reference pin and output can protect against this.

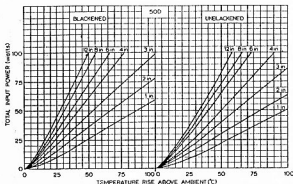
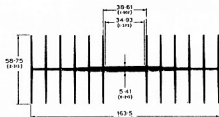
Whether these diodes are necessary depends on the type of regulator and its operating conditions and the designer must be guided by the manufacturers specifications. Regulator type LM117 requires this protection if used for output voltages above 25 volts. Figure 12 shows the protection diodes fitted to this regulator. As a general rule, if in doubt, put them in anyway; they cannot do any harm.

Protection diodes should be power types (say 1A) with sufficient surge rating to withstand the discharge surge.

THE SAMPLE SUPPLY

The sample supply, as shown in Figure 1, was actually built to power such loads as the 1675 transceiver (12.6V at 7A). Being adjustable down to 12 volts, maximum dissipation at the full load capacity of 10 amps, has to be calculated at 12 volts and this is as follows:

Dimensions in mm.
Inch conversions in brackets.



TOTAL INPUT POWER VS. RISE ABOVE AMBIENT TEMPERATURE FOR VARIOUS LENGTHS OF EXTRUSION, WITH NATURAL CONVECTION COOLING.

Figure 11 — 50D Heat sink.

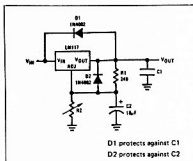


Figure 12 — LM117 Regulator with Protection Diodes.

$$P_m = (E_{DC} - E_{LMN}) I_L \\ = (18.5 - 12) \times 10 \\ = 45W.$$

A Beryllium washer with a thermal resistance of 0.1 °C/W was used to insulate the regulator from the heat sink and heat sink thermal resistance (R_{CS}) has been calculated as follows:

$$R_{CS} = \frac{T_J - T_a}{P_m} - R_{JC} \\ = \frac{175 - 40}{45} - 0.1 - 1.2 \\ = 1.7 °C/W$$

Using the Beryllium washer, the thermal resistance (R_{CS}) is very similar to that calculated previously for 13 volts using a higher resistance washer. As such, the heat sink examined before is suitable for this application.

SUMMARY OF DESIGN PROCEDURE

The following summarizes the design procedure as discussed in the previous paragraphs:

1. Select a suitable voltage regulator for the required output voltage (E_L) and maximum load current (I_L).
2. Calculate input voltage (E_{DC})
 $E_{DC} = 1.05 (E_L + E_{OC})$
where E_{OC} is the regulated drop out voltage.
3. Calculate load resistance (R_L)

$$R_L = \frac{E_{DC}}{I_L} \\ C = T = \frac{0.07 \times 10^6 \text{ microfarads}}{R_L}$$

- where T = time constant set at 0.07 second.
5. Calculate transformer secondary voltage (first estimate) (E_{RMS})
 $E_{RMS} = 0.7 (E_{DC} / 0.85 + 1.5)$
6. Select Rectifier Bridge:
Peak Inverse Voltage at least 2.8 E_{RMS} plus a 50 percent safety margin.
Peak Current not less than I_L .
7. Calculate minimum source resistance (R_{SM})
 $R_{SM} = \frac{E_{DC}}{0.85 I_{FSM}}$

where I_{FSM} is the surge current rating of the rectifier.

8. Check the source resistance (R_S) of the transformer
 $R_S = \frac{(V_{no-load} - V_{load}) R_{load}}{V_{load}}$

If R_S is less than R_{SM} , add series resistance to make it equal to R_{SM} .

9. Calculate ratio R_S/R_L and find ratio E_{DC}/E_{RMS} percent from Figure 4 for time constant of 0.07 second.

$$\text{Putting } R_S = E_{DC} \quad \%$$

Recalculate the R_{MS} secondary voltage
 $E_{RMS} = 0.7 (E_{DC} + 1.5)$

10. Calculate maximum secondary current (I_{RMS})
 $I_{RMS} = 1.4 I_L$

11. Calculate maximum power dissipation of the regulating device plus 10 percent margin (P_m)
 $P_m = 1.1 (E_{DC} - E_L) I_L$

- (Note: For a variable voltage supply $E_L = E_{LMN}$)
12. Calculate maximum thermal resistance of device heat sink (T_{JA})
 $T_{JA} = \frac{T_J - T_a}{P_m} - R_{CS} - R_{JC}$

where

- T_J = Maximum Junction Temperature.
- T_a = Maximum Ambient Temperature.
- R_{CS} = Thermal Resistance Case to Sink.
- R_{JC} = Thermal Resistance Junction to Case.

- Select heat sink from published curves.
13. Repeat calculation (12) for the rectifier. In this case $P_m = 1.5 I_L$
- Ensure adequate heat sink on chassis or external to chassis.
14. If the regulator is an adjustable output voltage type, calculate voltage divider reference resistors:

$$R_1 < \frac{E_{REF}}{10 I_{REF}} \\ R_2 = \frac{(E_L - E_{REF}) R_1}{E_{REF}}$$

where E_{REF} = Regulator Reference Pin Voltage

and I_{REF} = Reference Pin Load Current

15. Include RF bypass capacitors and protection diodes as may be required.

PACKET NEWS

The Department of Trade and Industry allowed a majority of packet radio to air on November 22, last year, for a period of one year on 146.850 MHz, before moving to the UHF and microwave amateur allocations.

Operation of the repeaters must be in accordance with the AX-25 Version 2 protocol. Bulletin Board, unattended operation and for non-repeater licensees, digipeating is not yet permitted.

Nearly 400 amateurs, have provided communication facilities for the New York City Marathon over the last 11 years. The recent event attracted over 20 000 starters and is classified as the world's largest marathon. Packet Radio communication was christened by the use of two stations.

Packet was dedicated to assisting in reporting some of the drop-out traffic as a back-up to the 21 traditional voice stations. The two stations handled about 35 percent of the 1090 competitors.

Next time, 25 000 runners are anticipated to compete. Packet will be there and it is anticipated if two stations can create a fine record, four or five will be better.

—Adapted from Gateway, Vol 3 No 8, December 5, 1986

MORSE INTERFACE

Arthur Forster VK2DKF
5 Hersey Street, Blaxland, NSW. 2774

It provides a "clean" processed output signal at TTL level, or a constant tone for feeding to cassette or the cassette input of a personal computer.

Many amateurs and SWLs have software programs that enable them to copy Morse from a communications receiver and display it on their personal computer. There are many hardware interface circuits for RTTY available to constructors, but very few interfaces to copy Morse. The writer has found that the simplest interfaces are not satisfactory when trying to copy Morse on a computer from the HF bands. Any noise spikes present on the signal are usually interpreted by the computer as dots and the print-out contains mostly garbage.

When training, the human ear can copy Morse code which is partly masked by noise, interference from adjacent signals and fading. The computer however, has not this level of intelligence. One other area where the human ear is superior to the computer is in the spacing of the dots and dashes. If the correct spacing is not maintained by a hand keyer the computer will not be able to copy properly, irrespective of this interface.

In principle, the function of this circuit is to provide a sharp narrow band filter, followed by an audio tone decoder. Although the filter will provide good selectivity to interfering signals, it

is not sufficient for pulse-type noise which has a relatively large bandwidth. Hence the signal is further processed by applying it to a tone decoder, integrator and comparator.

CIRCUIT DESCRIPTION

This interface consists of two parts:

- 1 A sharp audio filter centred on approximately 800 Hz.
- 2 A tone decoder and processor circuit.

The audio filter is composed of an input buffer stage IC1, followed by a four stage active filter, IC2, IC3. This filter gives very sharp rejection to any signals either side of its centre frequency. It is very useful when decoding a signal very close to unwanted signals.

The output of the filter is then fed via a resistive attenuator network to the input of the Tone Decoder, IC4, on the second board. The back-to-back diodes ensure that the input signal level is limited to 600 mV peak-to-peak.

The frequency of the Tone Decoder IC4, is set precisely to the filter centre frequency by R27, C19 and preset potentiometer. The output of IC4 at pin 8, goes to logic 0 as soon as a 800 Hz signal is applied to its input, causing the lock LED to light. However, the Tone Decoder also responds to short interfering noise spikes

This Morse interface circuit can clean up noisy Morse signals copied from a HF receiver.

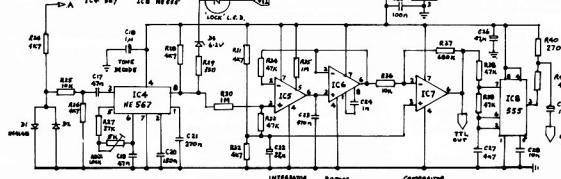
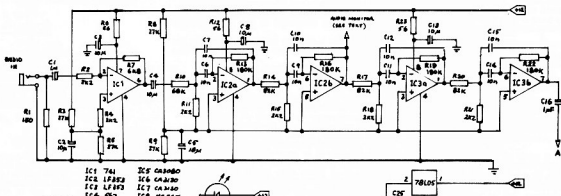
that pass through the earlier filter. These pulses are eliminated by the following circuit consisting of IC5, IC6, IC7.

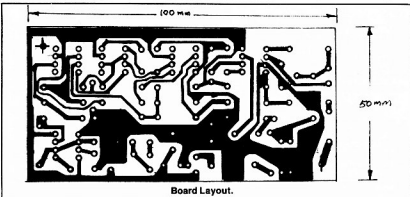
IC5 is configured as an integrator whose time constant is determined by the control current flowing via R35 into pin 7 and by capacitor C23. This has the effect of eliminating short pulses. IC6 is a voltage follower to prevent loading on integrating capacitor C23. IC7 is configured as a comparator with a threshold voltage of 2.5 volts.

The output from pin 6 of IC7 will be at TTL level, going between 0 volts and +5 volts, depending on whether a tone (dot, dash) is present or not. This output can be used to interface with the input port of a computer that requires a TTL input.

The writer designed this interface for use with a software program for the VZ200/300 that requires an audio tone input to the cassette input of the computer. Therefore, IC8, an NE555 timer, is configured as a square-wave

AUDIO FILTER

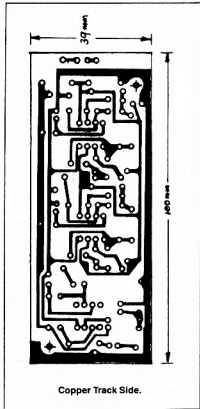




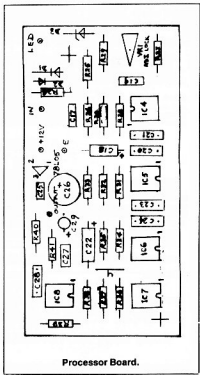
If an audio monitor point is required, it could be taken from the output of IC8 but a better point would be from pin 7 of IC2 in the CW filter. The monitor signal could be buffered by a simple IC audio amplifier as per Figure 3 and brought out to a socket to drive a speaker or headphones. The circuit is supplied from an external 12 volt source that could be a DC plug-pack. The +5 volts rail is derived from the +12 volts rail very simply by using a 78L05 low power regulator transistor.

First check that the voltage on the input bias pins of the ICs is approximately half the rail

R1		150 ohm
R2, 4, 11, 15, 18, 21		250 ohm
R3, 5, 8, 9, 27		275 ohm
R6, 12, 23		56 ohm
R10		68k ohm
R13, 16, 19, 22	(2 percent) 180k ohm	
R14, 17, 20	(2 percent) 82k ohm	
R24, 26, 28, 31, 32, 33, 34, 35, 39		4k7 ohm
R29		330 ohm
R30, 35		1M ohm
R25, 36		10k ohm
R37		680k ohm
R40		270 ohm
R41		47 ohm
R42	(preset not)	5k ohm



Copper Track Side.



Processor Board.

CAPACITORS

C1, 16, 18
C2, 3, 4, 5, 8, 13, 29
C6, 7, 9, 10, 11, 12, 14, 15

C17, 19

C20

C21

C22

C23

C24

C26

C27

C28

INTEGRATED CIRCUITS

IC1

IC2, 3

IC4

IC5

IC6, 7

IC8

IC9

DI, 2

D3

(electro) 1 μ F
(tantalum) 10 μ F
(greencap 5 percent) 10 nF
(greencap 100V) 47 nF
(greencap 100V) 150 nF
(greencap 100V) 270 nF
(electro) 22 μ F
(greencap 100V) 470 nF
(greencap) 1 nF
(electro) 47 μ F
(greencap) 4n7
(disc ceramic) 100 nF
(disc ceramic) 100 nF

741
LF353
NE567
CA3080
CA3130
NE555
78L05
IN4148
6.2 volt zener



QSP

ELECTRO-MAGNETIC PULSE PETITION

A petition has been presented to the FCC seeking a Notice of Inquiry on the subject of mandated EMP protective measures for telecommunications equipment under the Commission's jurisdiction. It is felt that the nation's economy is extremely vulnerable to severe disruption by high altitude nuclear explosions that might occur as a result of a variety of scenarios short of a general nuclear strike.

—From The ARRL Letter/September 2, 1986

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PICTURES BY AMATEUR RADIO

At the Kingston Amateur Radio Club meeting held on November 4, 1986, members of the Belleville TELIPAK Group, led by Syd Horne VE3EGO, demonstrated TELIPAK — a system which provides the capability for amateurs to exchange high-resolution, error-free, digital colour images, text speech and graphics.

The novel aspect of the lecture and demonstrations was that the pictures used for the talk were transmitted by packet radio from Belleville to Kingston using digipeaters, VE3TPK and VE3NFW. Barry VE3CJC, transmitted the pictures from Belleville and they were received by Syd VE3EGO, in the meeting hall at Kingston.

It is believed that this is the first time that digital colour pictures have been transmitted for a talk using packet radio techniques.

Does any Australian challenge the Kingston Club's claim?

—Written by Bob Boyd VE3BV, Program Chairman, Kingston Amateur Radio Club, Kingston, Ontario. Contributed courtesy The Editor, The Canadian Radio Amateur

THOUGHT FOR THE MONTH

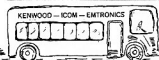
He who throws mud loses ground!

DEFAUSSAT

Australia is committed to using its domestic satellites for military communications and will begin using a 12 watt AUSSAT transponder before 1990.

The Defence Department is planning to use 10 unmanned earth stations and two portable dishes to supplement an existing defence network of HF radio, microwave radio and cable systems.

The second generation of AUSSAT, now on the drawing board, could also include cross-band frequencies 718 GHz, which are reserved for defence-related satellite services.



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- HL-60U 10-60W, GaAsFET, UHF \$349
- HL-120U 10-100W, GaAsFET, UHF \$699
- HL-1KX 160-10m, 1 kW i/p w/o tubes \$1299

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- * 2m, 3 el, gamma match, Yagi \$20
- * 2m, 4 el, gamma match, Yagi \$29
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- * 70cm, 6 el, gamma match, Yagi \$20
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- CA-33 Tribander \$379, CA Helicals \$39 ea.
- JD181 SWR meter, compare \$29!
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The AR-88 was a general purpose receiver covering 535 kHz to 32 MHz in six bands.

The AR-88 communications receiver was originally designed by the RCA Amateur Radio Section in 1939-40, as a successor to their AR-77 for the USA amateur and commercial market. It was a general purpose receiver covering 535 kHz to 32 MHz in six bands and with deluxe features such as switchable selectivity, a noise limiter, and tone control.

However, before the AR-88 reached the market, England became embroiled in World War Two and had a tremendous need for modern communications gear. (The pathetic state of their radio preparedness in 1940 is another story!). Such was the demand for the AR-88 that four factories in the USA and Canada worked flat-out on UK and later US requirements.

The original AR-88 for the amateur market had an S-meter but few of the sets made actually were fitted with one because of wartime shortages. The AR-88D is the most common model and has an additional audio output at an impedance of 600 ohms to suit balanced lines, as well as the standard 2.5 ohm speaker output. The AR-88LF version covers the LF range in lieu of the broadcast band and has a higher IF frequency. The RAF made certain modifications to their sets and called them the R1556, 1556A, and 1556B. The sets were also used in Russia during the latter part of the war.

There are minor differences in construction techniques over the production span of the sets; for instance, the front panels were originally engraved, but later ones were simply stenciled. It was available free-standing or for rack-mounting, and a separate matching speaker, code MI-8303D, could be supplied.

characteristics. The IF frequency is 455 kHz (735 kHz for the AR-88LF) and there is also a simple crystal filter at 455 kHz (735 kHz) which comes into circuit in the third, fourth and fifth selectivity positions. A separate BFO oscillator provides a signal into the second IF stage. After the IFs, a double diode circuit detects the audio and provides AVC. Another double diode acts as a noise limiter. Two stages of audio amplification then provide 2.5 watts of audio to the 2.5 ohm terminals, and 10 milliwatts to high impedance headphones.

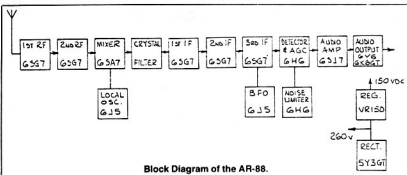
The Front View of the RCA AR-88 LF Panel lettering is engraved and paint filled. Note the handles and end trims to improve the appearance.

gauge steel. A hinged lid on the case allows access to the internals and the case slides off for major maintenance.

The control layout across the front of the set is as follows:

Top Left: a variable tone control, followed by the main tuning dial with the six bands marked on a rotating disc. Then comes the 0 to 100 vernier dial, a nameplate where the S-meter was intended, and the variable noise limiter control. The main tuning dial and the vernier dial are coupled together by a gear drive so only one tuning knob is needed.

Middle: the antenna peaking capacitor knob is to the left of the main tuning knob which is very smooth in operation but slightly highly geared for



Block Diagram of the AR-88.

As can be seen in the Block Diagram, the electrical arrangement is conventional for the time, but includes comprehensive features. It is of course valve operated and has a total of 14 glass or metal 6.3 volt filament valves. The antenna input caters for single wire or balanced input at 200 ohms impedance. There are two RF amplifiers to aid image rejection, followed by a mixer which is fed by a separate local oscillator. There are then three IF stages with switchable coupling (five positions) to achieve different bandpass

The normal power supply has a tapped mains transformer to allow input voltages from 100 volts to 260 volts with a 5Y3GT rectifier and a VR150/30 voltage regulator. A vibrator power supply unit, code MI-8319, was available and the set could also be run off six volts 'A' and 250 to 300 volts 'B' batteries.

Mechanically, the set is built on a heavy gauge steel chassis, with the four gang tuning capacitor and front and tuning coils enclosed under a shielded cover. The front panel is also heavy



The View through the Top Cover of the AR-88 LF. The power transformer is at the top-left, IF and audio stages at the top-right. RF and tuning components are under the cover marked with an X.

easy SSB tuning. Directly below this tuning knob is a lock screw to hold the tuning setting. On the right is the variable BFO control.

Bottom: on the left is the mains switch with positions of OFF, TRANS (transmit mute), REC, MOD (receive phone) and REC CW positions. The six position band switch is next, followed by RF and AF variable gain controls. Next again is the five position selectivity switch and then a switch for MAN (no AVC), MAN N L (is no AVC, but noise limiter on), AVC N L, and AVC.

Some sets had a separate ON/OFF switch below the bottom left control switch, which was then only a three position switch. A headphone jack is fitted between this switch and the band switch.

The back panel has screw terminals for antenna, audio out, and T/R switching, as well as a voltage change plug.

The basic specifications are:

FREQUENCY RANGE of the AR-88 and AR-88D	
Band 1	535 to 1.600 MHz
Band 2	1.570 to 4.550 MHz
Band 3	4.450 to 12.150 MHz
Band 4	11.900 to 16.600 MHz
Band 5	16.100 to 22.700 MHz
Band 6	22.000 to 32.000 MHz

FREQUENCY RANGE of the AR-88LF	
Band 1	73 to 205 kHz
Band 2	195 to 555 kHz
Band 3	1.480 to 4.400 MHz
Band 4	4.250 to 12.150 MHz
Band 5	11.900 to 19.500 MHz
Band 6	19.000 to 30.500 MHz

Sensitivity was about 1.5 microvolts for 6 dB signal-noise ratio across all bands.

Selectivity (at 20 dB points) is 16 kHz bandwidth in position 1 to less than 1 kHz in the sharpest position. The crystal filter phasing could be set to narrow the passband.

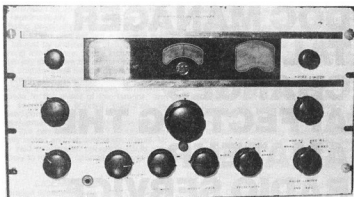
Dimensions: Approximately 489 x 279 x 489 mm (WHDD).

Weight: I saved this figure until last! The darned thing weighs 45 kilograms, or 100 pounds — not exactly portable!

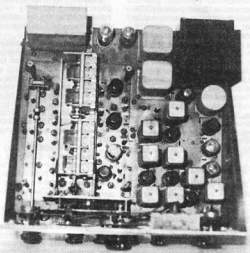
For its era, the AR-88 was a top-class, solid (boy is it solid), stable receiver with advanced features. It performed valuable service during WWII alongside HRO and Hallicrafters receivers and was still in use in commercial services until at least 1980.

I am indebted to VK2ZJF, VK2KGB and Stewart Griffiths for donations of equipment and for information for this article.

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The front panel of the AR-88 HF version. Panel lettering is stencilled on.



Top view of the AR-88 with all covers removed.

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DOC MANAGER TALKS ON CHANGES AFFECTING THE AMATEUR RADIO SERVICE

Jim Linton VK3PC
4 Ansett Crescent, Forest Hill, Vic. 3131

We live in times of great change and amateur radio is experiencing pressures which are reshaping it. In an interview for Amateur Radio magazine, DOC's Manager Regulatory, Operations Branch, Radio Frequency Management Division, David Hunt, outlines developments and trends affecting the Amateur Radio Service. He discusses a number of key issues, including DOC examination development plans, new transmission modes and techniques being accommodated in licence operating conditions, the era of deregulation, an explanation on licence fees and the future.

EXAMINATIONS

The process of examination development (DOC having outside bodies to conduct exams) would have to be the most significant change to the amateur service since the introduction of the Novice Licence. That was how Mr Hunt assessed this proposal which had yet to pass the draft and consultation stage.

He said the object was to allow amateur theory, regulations and Morse examinations to be conducted by education colleges and the amateur radio fraternity. And, in areas of need, DOC would like to encourage individual radio amateurs to conduct examinations, Mr Hunt said.

"One of the fundamental advantages of doing that we see is allowing access to examinations which aren't available at the moment."

"The Department is constrained to run exams every three months, normally on a week day. We're unable to support examinations outside normal hours."

"I'm sure there's a lot of amateurs out there, particularly in remote and country areas, who want to get access to examinations — it's very restrictive at the moment."

He said DOC was particularly encouraged to do this because of the self-discipline and high esteem of the amateur service. And, by colleagues doing the examinations, DOC considers the standard of instruction would be maintained or even increased.

"I'm not saying that the radio amateurs themselves, through the clubs and the WIA aren't doing a very good job — they're doing a terrific job," Mr Hunt said.

"But, colleagues, by their whole background and tradition are more experienced."

"I think you'll get a far more professional coaching and tuition from a college than what some of the amateur services are able to do — obviously there are a lot of very good educators in the WIA and we recognise that."

DOC had released a draft accreditation package for its proposed examination involvement and set a four month consultation period (November 1986-March 1987) for comments and responses.

Mr Hunt said: "Our objective is to make it work. We're aiming to have it working by January 1, 1988."

DOC wanted to, not only have outside bodies conduct exams, but also set the examination papers and Morse receiving test tapes.

Mr Hunt said: "What we intend at the moment is for our question bank, developed in consultation over the years with the WIA, to be given to the Institute (note: this had not been formally agreed to by either DOC or the WIA), to set the exam papers for use by those in the amateur service conducting exams."

"The colleges, it was assumed, would set their own examinations from their own courses."

"We would arrange to assess, from time to time, examination papers used by the colleges — that's how we would maintain the exam standard level."

Asked if this could lead to differing standards of papers being set — by various colleges and the amateur fraternity, he replied: "I think time will tell obviously — we'll be very conscious of those sorts of developments."

Mr Hunt also pointed out that the Radiocommunications Act provided for any candidates to be re-examined to assess their qualifications. While this option would not be actively promoted it was an avenue available to check if a standard was being maintained, and would be used if found necessary, he said.

"I would hope that, when the question bank is made available to the Amateur Service, at least within the service, the standard of examination would be very similar to the sort of exams we're using now."

"There shouldn't be any significant difference — it's the same questions — different groups of questions used in different examinations."

Mr Hunt said the experience of colleges should allow them to set exams by following the syllabus and typical DOC sample paper contained in their accreditation package.

"We would like to see the colleges use that (syllabus and sample paper) as a guide for the setting of their examination papers," he said.

It was unknown whether colleges wanted to do the Morse tests. In that case, perhaps the WIA or the amateur fraternity itself could do them, Mr Hunt suggested.

It would be the responsibility of those holding the exams to set whatever fees they wanted to charge.

The exam fee, until August 1985, was \$2, and refundable as a credit for a subsequent exam if the candidate did not sit. With the introduction of the Radiocommunications Act the fees were increased in line with the Federal Government's user-pays policy. They now reflect the administrative and clerical costs of exams, which includes hiring venues. Current DOC exam fees are: Theory \$10, Regulations \$5, Telegraphy Receive \$10, Telegraphy Send \$5, or a total of \$30.

REGULATIONS EXAMS

The public release of the entire question bank for the regulations exam might occur after the revised Amateur Operators Handbook is released this year. The logic of this was that the regulations exam could be likened to learning the laws of the road for a driver's licence, which were freely available.

Mr Hunt said: "I would like to see that — it's something we will be examining with a view to implementation."

"There's a good scope to introduce that sort of system with the regulations exam."

The failure rate in the regulations exam could be partly attributed to the difficulty in studying caused by the contents and format of the current handbook. Having the question bank available, a candidate could fully study the laws and regulations applying to the Amateur Radio Service.

SPECIAL EXAMS

With devolution of exams, those candidates who require special exams due to a disability would be catered for under the new arrangements.

Mr Hunt said because there were so few of those exams, it was currently thought the Department would continue them.

But this matter could not be finalised until consultation with the amateur fraternity on the devolution of exams had been completed. He explained: "The examination method for disabled or handicapped persons is totally different to a normal exam environment."

"If that was divested, obviously we would be giving some guidance and instructions to people on how they ought to be conducting them — every case is different."

DEREGULATION

Mr Hunt saw deregulation as allowing the Amateur Service to achieve more by way of self-regulation.

"We are extremely fortunate in Australia to have an Amateur Radio Service which imposes upon itself, a very high degree of discipline," he said.

Mr Hunt noted there had been very few instances where regulatory action was needed against a radio amateur.

"A lot of moves we're making lately would not be possible without the self-discipline we see from the amateur service."

"It's one of the few services which runs by itself, develops its own initiatives and does extremely well — we want the service to develop in its own way without being restrictive."

He said it was important for the Department to recognise and try to encourage the achievements radio amateurs were making.

"What we wouldn't like to see is guidelines and regulations which need interpretation and are restrictive in the development of the amateur service."

"We would like to reduce guidelines, regulations and conditions to the least extent possible."

"Obviously, where radio amateurs use shared bands, there's a need to set parameters for the service to operate in such bands."

Mr Hunt said the Department's resources were limited and deregulation was aimed at using available resources effectively. This could not be

done by spending time producing guidelines and sets of conditions, and then having to administer them, he said.

Along with expanding technology, DOC's workload was growing with new categories of communications service developing each year, and it had to use its limited resources dealing with priority or problem areas.

REVISED HANDBOOK

A new Amateur Operators Handbook, to be released this year, will greatly reflect the era of deregulation and greater reliance on self-regulation which sees a freeing-up of controls on the Amateur Radio Service. It also addresses the impact of new technology and offers a greater flexibility to radio amateurs. The Handbook was in need of urgent revision because of the changes which had taken place since the last published revision in 1978, and the introduction of the Radiocommunications Act. The Handbook would be in an easier to follow format, with a logical sequence of chapter material on the technical operating conditions, regulations and licensing requirements.

It will be a must for every shack and intending exam candidate. Effectively, all licensees should refer to it for the conditions under which they operate.

A draft of the new Handbook suggests a relaxation on types of emission limitations above 30 MHz. This will be a radical change from the current situation where all permitted transmission modes are classified and defined in the regulations. The move reflects the role of amateur radio in radio communication technique experimentation — opening the way for experiments with any known transmission mode and, indeed any so far undefined techniques.

Mr Hunt said the Department believed some existing provisions were unnecessarily restrictive and may hamper the service's development.

A chapter on Technical Requirements was likely

to include provision for unattended stations which may be automatically operated without the licensee being physically present to control the transmitter. It would also set out additional conditions to be met by unattended stations to avoid them causing interference. These include a timer to automatically shutdown the transmitter after 10 minutes of uninterrupted transmission, a fail-safe device to prevent the transmitter operating due to a malfunction, a means of promptly terminating transmissions in the event of interference, and adequate security to prevent operation by unauthorised persons.

This development was in response to emerging techniques like packet radio, RTTY mail boxes, and digitally stored and retrievable voice mail. Mr Hunt also said unattended operation could also equally apply to remotely operated stations using telephony.

LICENCE FEES

Amateur station licence fees rose last October by \$3 to \$26 — and DOC considers the fees are the lowest possible. Mr Hunt explained that government set the level of overall increase in radio communication licence fees revenue in context with its Federal Budget considerations. "In practical terms, as far as the amateur service fees are concerned, they do little more than just cover administrative costs."

The fees were the lowest possible when you look at the Department's resources applied to the amateur service and costs, he said.

Part of the considerations in setting fees is to look at those categories of service that need to be fostered.

"Obviously, with the amateur service, as one example, we wouldn't want to be seen producing a fee level that is going to discourage people participating in the service," Mr Hunt said.

THE FUTURE

What role does DOC see for the amateur service

in the short term, the year 2000 and beyond?

Mr Hunt said the Department, or anyone else, could not easily predict what the future held with all sorts of technological developments occurring.

"It might importantly our responsibility is to allow it to happen — allow the amateur service to become part of the progress of technology change."

"We wouldn't want to impose any restrictions on the amateur service to not experiment and develop new techniques in communication."

"But, the Department likes to see it continue growing and doing all the good things it's doing right now," he said.

In the past, some very important developments in radio communication techniques have been pioneered by radio amateurs, Mr Hunt said.

For this reason, DOC saw the amateur service as a benefit to the nation and it was also aware of the on-going contributions made by WICEN and other community related activity groups. Mr Hunt said the Department wanted to encourage the community service and emergency communications activities. He said the hobby also provided an environment for people to get involved in committees and be part of the running of the amateur service.

Does he see any future restructuring of the licensing system? The amateur service itself would decide if it wanted any restructuring and let the Department know its views, Mr Hunt said.

"There's a lot of ideas which have been promoted (about restructuring) and the encouraging thing is that it's generating a lot of thought and discussion."

"To date there's been no pressure on us to change the system or structure. We would always be wide open to those sorts of ideas — and if the amateur service felt there was need for change it's important DOC accommodate this in the best way it can," he said.



International News



NEWS FROM SINGAPORE

Amateurs in Singapore are permitted to use the 10.1, 18.1 and 24.9 MHz WARC bands as of January 1, 1987.

As elsewhere, amateurs are the Secondary Service and must not cause harmful interference to stations of the Primary Service operating in these bands. The 18.058-18.168 and 24.890-24.990 MHz bands will become a Primary Service allocation with to 9V1 amateurs after July 1, 1989, but in accordance with the ITU Regulations, the 10.100-10.150 MHz band will remain a Secondary Service allocation for the Amateur Service.

Singapore Telecoms announced the opening of the WARC bands on December 2, 1986.

The Singapore Amateur Radio Transmitting Society has announced that it is strongly recommended that all 9V1 amateurs should adhere to the IARU Region III Band Plans for these three new allocations.

INAUGURAL SYMPOSIUM

Richard Butler, Secretary General of the ITU, recently announced the ITU-COM 89 Inaugural World Broadcasting Symposium and Exposition will be held at the Convention and Exhibition

Centre, Geneva, between October 3-9, 1989.

Geneva, headquarters of the ITU and other international organisations and the focal point for many high-level professional and policy summit conferences, offers the appropriate facilities including 72 000 square metres of available floor space to hold the symposium and exhibition.

Further details may be obtained by writing to ITU-COM 89, Place des Nations, CH-1211, Geneva 20, Switzerland.

REPUBLIC OF KIRIBATI

By its accession to the International Telecommunication Convention (Nairobi 1982), registered on November 3, 1986 by the General Secretariat of the International Telecommunication Union (ITU), the Republic of Kiribati has become the 161st member of the ITU.

Kiribati became an independent republic in 1979. It comprises 33 islands, with a total land area of 717.1 square-kilometres, spread over some five-million square kilometres in the south-west central Pacific Ocean. Its population (1985 census) is in the region of 83 800.

According to the 1986 International Call Book there are 16 licensed radio amateurs on Kiribati.

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TYPE	DIAM	LENGTH	TP	IND ±H	SWG	PRICE
1-08	1/8"	3'	8	2.00	19	\$2.12
1-16	1/16"	3'	16	5.50	21	\$2.12
2-08	1/8"	3'	8	2.00	19	\$2.50
2-16	1/16"	3'	16	8.00	21	\$2.50
3-08	3/16"	3'	8	2.90	19	\$3.05
3-16	3/16"	3'	16	10.90	21	\$3.05
4-08	1"	3'	8	4.80	19	\$3.38
4-16	1"	3'	16	19.90	21	\$3.38
5-08	1 1/4"	4'	8	9.40	18	\$3.74
5-16	1 1/4"	4'	16	37.50	21	\$3.74
8-04/4	2"	4'	8	—	18	\$5.45
8-10/4	2"	4'	10	32.25	18	\$5.45
8-12/4	2"	4'	12	—	19	\$5.95
8-16/4	2"	4'	16	83.50	19	\$5.95
8-08/7	2"	7'	8	—	18	\$9.45
8-10/7	2"	7'	10	60.80	18	\$9.45
8-12/7	2"	7'	12	—	19	\$9.95
8-16/7	2"	7'	16	157.75	19	\$9.95

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The coils listed above are classed as 'Bulk Inductance' and are intended to be priced for individual requirements. Complete coils can be used of course, if the total inductance is the value required.

The inductance values shown are approximate allowing for any variations in wire gauge and other small manufacturing variables.

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ICOM IC-28A TWO-METRE FM TRANSCEIVER

The Icom company has always been in the front ranks with their two metre equipment. If we look back over the years, there have been a few Icom transceivers that have, for the time, set new standards.

Certainly the IC-22 series must be included amongst these. The last of these, the 22S, must have been the best selling two metre FM transceiver of all time and, even today, are still sought after on the secondhand market. In later years, the IC-25 and IC-27 series have proven popular. The new IC-28 sets new standards for size and operating simplicity.

FEATURES

There is no doubt that the first impression of the 28A is the diminutive size. The depth is actually 50 mm less than the model it replaces, the IC-27A. Take a look at the photograph with my hand on it and you will get an idea of its size. Trying to fit a transceiver into a recent model car is often a matter of finding enough depth. A set would often fit under the dash-board if only that air-duct or whatever was not in the way. Here is the answer to the problem. In actual fact, the front panel size is slightly larger than the 27A — but let us look at the comparative sizes.



Note the compact size of the 28A. Try this with your two metre FM mobile.

The 27A is 38 x 140 x 191 mm (HWD), with the 28A 50 x 140 x 133 mm (HWD). Weight is only 0.95 kg against 1.2 kg for the older model.

Of course, size is not the only factor that comes into the choice of a new two metre transceiver, and, as we shall see later, the operation of this transceiver is also a delight.

At long last, Icom have developed a multi-function LCD display for the new rig, to replace the old LED readout. The old 25-A went from a red to green display and the 27-series continue with the green. However, while the green was better, it still suffered from a lack of readability under strong light conditions. The new display has overcome all these problems and, at the same time, gives the user a great variety of information. This includes: Frequency, Memory Selection and Memory Channel Selected, High or Low Output Power Selection, Memory Channel Skip Indication, Duplex Mode (+/-) Indicator, Offset and Tuning Step Memory Write Indicator.

Operation of the optional digital code squelch is also indicated, however this option was not supplied on our review transceiver.

The IC-28A has 21 memories which can be programmed for frequency and repeater offset or simplex operation. A memory skip can be entered to eliminate non-required channels when in the memory scan function. Frequency and memory selection is via the 'tuning knob' on the left-side of the front panel or via the up/down buttons on the microphone. VFO or memory operation is selected by the adjacent rocker switch.

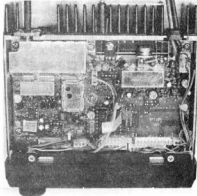
When in VFO mode, a variety of tuning steps can be selected. These are either five, 10, 15 or 25 kHz. For our Australian system, the 20 kHz stepping is ideal, with, perhaps, the five kHz steps as an option. The European version has the option of 12.5 kHz steps. When a band-scan is selected, the scanning rate follows the selected tuning rate. A priority or call channel facility is fitted which allows the selection of memory 21 with either VFO or memory operation in use. Unfortunately though, there is no priority alert, or sampling system, as there was with the old IC-27, or as provided with the recently reviewed Kenwood TM-2550A. With the 28A it is simply a method of selecting channel 21 without going through all the other memories to get there!

The transmitter output is a very useful 25 watts and, considering the compact size of the unit, this is quite remarkable. A 45 watt output version is also available, but we did not have an opportunity to test this. On both versions, a five watt low-power output is selectable. With repeater operation, a

push of the squelch control gives a listen on input frequency facility. This does not lock on, so you cannot get yourself onto the wrong transmit frequency — a smart idea.

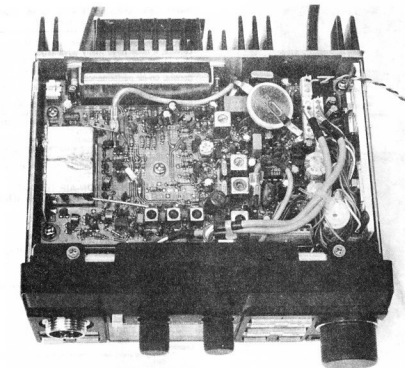
The internal construction is typically Icom. Most of the components are mounted on two large (relatively) circuit boards. These are separated by a central shielding plate which provides both good shielding and mechanical stability.

The circuit used appears to be fairly straightforward, but our details were obtained from the



Top View.





Bottom View. Note Lithium Battery in right-top corner.

block diagram only as circuit and printed board layouts are, for some unknown reason, not supplied. I am not sure whether a workshop manual is available. Icom have been running rather slow with their repair manuals of late.

The receive signal goes to the 2SC3355 RF amplifier via the transmitter lowpass filter, diode antenna switch and switchband pass filter. The first IF is at 17.2 MHz; second is 455 kHz and a MC3357P IC performs the second conversion, IF amplification, FM detection and noise amplification for the squelch circuit. Transmitter output employs a module which is attached to the rather small heatsink at the rear of the cabinet.

Memory retention is powered by a lithium battery. As can be seen from the internal photographs, the battery is very accessible. However do not be tempted to play around with it. The manual suggests that battery replacement should be entrusted to your Icom service centre. It appears that the usual Icom back-up system is used. That is when the battery life is expired, the system has to be re-programmed by the service centre. Although, as Icom have been saying in their advertisements in American magazines, the battery life could well be in excess of the users life, time will tell!

Both the antenna and DC power connections are via flying leads. The antenna lead is terminated in an SO-239 line socket while the DC uses a locking two-pin plastic connector and a fuse in both the positive and negative leads. Unfortunately, the DC connector is a new type and not compatible with any of the previously used Icom DC connectors.

ON-THE-AIR

I used the 28-A over a period of two months, both mobile and as a base station. During that period, in excess of 7000 kilometres were covered over all sorts of roads, both good and bad, and with temperatures up to the mid-30s in the northern Flinders Ranges, South Australia. This was one of the hardest tests that I have subjected a review transceiver to and it came through with first-class results.

On the original installation, one lesson was quickly learned. Don't try to run the transceiver from the car cigarette lighter socket. I found in two cases that the 28-A does funny things when it does not have a good earth to the car body. At the time, I was also using a magnetic base antenna which did not actually make any electrical connection to the car. I must be fair and say that the Icom Instruction Book states that a direct connection to the car battery is required. So be warned — do the job properly.

With the 21 programmable memories, the IC-28A is about the easiest two metre FM transceiver to use that I have ever seen. It is certainly more straightforward to use than the old IC-22S. I found that once the required channels had been programmed into the memory, I used the memory mode all the time. The VFO can be used to scan the band in your preferred selectable steps, either via the 'tuning' knob or from the up/down buttons on the microphone. The up/down button on the front panel does not produce the same effect as the microphone buttons. In the VFO mode, they give a one MHz up-down step, while with memory mode selected, it will step up or down to the next memory, but will not initiate a scan situation, which the microphone buttons will. It is therefore more convenient to use the microphone for either scanning or memory selection.

The microphone also has a small scan-inhibit switch on the back. Transmit audio reports were always very good. It seems that the overall audio gain has been carefully selected as almost no mobile noise is audible on the transmitted signal. Quality is sharp and crisp with just a very slight trace of sibilant distortion.

On receive, the audio output was only just adequate under average mobile conditions. If yours is a noisy car, you will certainly need an external extension speaker and, in even a quiet car, it would be recommended. The actual received audio from the tiny internal speaker is surprisingly good, but it was unable to take the full output of the receiver without considerable distortion.

There are several nice features on the transceiver that make operating a pleasure. The push-on, push-off power switch on the volume control

and the push to select repeater reverse operation on the squelch control are two that come to mind.

The memory scan is a very useful system. As each busy channel is encountered, the scan pauses for about 10 seconds before the scan resumes. If you want to stop on that channel, it is only necessary to quickly push either the PTT button or one of the up/down buttons.

Should any memory channel require skipping, this can be selected with a push of the 'step' button. The word Skip will now appear in the bottom righthand corner of the LCD display and those channels will be passed-over during the scan operation.

The receiver seemed to be very free from cross-modulation from nearby commercial and strong amateur signals. It was possible to leave the receiver scanning without the annoyance of unwanted spurious signals stopping the scan. The actual receiver circuit is very simple and straightforward. The RF stage, which is a 2SC3355, is fed from a two-stage input filter. The first mixer, a 2SK125 FET, converts to the first IF at 17 MHz. The second IF is at 455 kHz. Two filters, one two-section crystal filter at 17 MHz and a ceramic filter at 455 kHz, take care of selectivity. The general coverage receiver's performance was excellent with the only point of criticism being a small degree of ignition noise break-through. This appeared on both strong and weak signals at about the same level. Perhaps this indicates a slight lack of limiting in the 455 kHz IF section. In actual practice, it did not prove to be too annoying.

Several options are available for the IC-28A. These include a base station AC power supply, the PS-45. This is a compact switch mode supply that can deliver eight amps output at 13.8 volts. Two different base station microphones are compatible with the IC-28, the SM-10 and the SM-8. In actual fact, the older Icom SM-5 and 6 microphones work very well with the transceiver, but they lack up/down scanning buttons which are essential for the actual scanning operation.

Three mobile microphones are available in addition to the standard HM-12. These are the HS-15, which is a flexible type microphone and can be fixed to a convenient point in the car. The IC-HM16 and 17 are speaker microphone units. The 17 has a tone-burst unit built-in for European repeater operation. Digital code squelch and tone squelch units are also available. I wonder when these will be built in as standard. When this does eventually happen, and so long as all of the Japanese manufacturers produce compatible units, these systems might become popular. Time will tell. None of the above options were supplied with our review transceiver and so therefore were not tested for this review.



Front view.

ON-TEST

The following test equipment was used to produce the figures obtained during our tests. Yaesu YP-150 and Marconi TF-9571 terminating RF watt meters; Marconi TF-957A/5 signal generator; AWA F242A noise and distortion meter and a Daver audio power output meter. All tests were carried out with a regulated 13.8 volts applied to the transceiver, unless otherwise stated, and all tests were carried out at 146 MHz.

Transmit Power Output

With high power selected, the output was constant right across the entire band at 30.5 watts. With low power selected, it was exactly on five watts, gain right across the band. As a test, the supply voltage was reduced to 11 volts. Operation of the transceiver was still quite satisfactory and the high power output was 22 watts.

Rear view showing Flying Lead Connections for Antenna and DC Power.

than many other current two metre FM transceivers, it does have many advantages, particularly in the very simplified operation. The other important aspect is the very compact size. The general on-air performance is very good indeed, and probably the only point of criticism is the very small loud speaker, however, considering the overall size of the transceiver, it would be almost impossible to fit a larger one in. I was so impressed with the little rig that the review model is now a permanent part of my shack.

Our thanks to Icom Australia for the IC-28A used for this review and inquiries regarding price and availability should be directed to them or to one of their authorised agents throughout Australia.

EVALUATION AND ON-AIR TEST AT A GLANCE of the Icom IC-28A ... Serial No 001284

APPEARANCE

- *** Strong well presented carton with foam insert.
- Weight and Size
 - *** One of the most compact 25 watt, two metre FM rigs yet seen.
- External Finish
 - *** A real black-box, but neatly finished.
- Construction Quality
 - *** Well put together with good looking circuit boards and wiring.

FRONT PANEL

- Location of Controls
 - *** A very simplified panel layout. Easy to follow.
- Size of Controls
 - *** Tuning, volume and squelch are very accessible. Push buttons are small but well located.
- Labelling
 - *** Very good under well lit conditions, not so good in the dark.

RECEIVER OPERATION

- Memories
 - *** With 21 memories that include offsets, one of the best.
- S-meter
 - *** Shows if you are receiving signal. (See test section).
- Spurious Responses
 - *** In most locations it is very clean. A few strange signals when operated in the city centre.
- Sensitivity
 - *** Very good. See Test Section.
- Received Audio
 - *** Internal speaker is rather small and limited in a normal speaker is rather small and limited in audio output. With better external speaker it is quite reasonable.

TRANSMIT OPERATION

- Power Output
 - *** Excellent for size of transceiver. See test section.
- Transmit Audio
 - *** Sharp clear quality. Deviation well set-up.
- Cooling
 - *** Fan moderately cool for power output.
- Metering
 - *** LCD power output indication and on-air light.
- Status Indicators
 - *** Plenty of information in the LCD readout.

Manual

- Owners Book
 - *** Excellent operating instructions. Poor technical information. No circuits or parts layout.

OVERALL RATING

- *** With its excellent operating ergonomics, compact size, and good power output, it is one of the best available for mobile use.

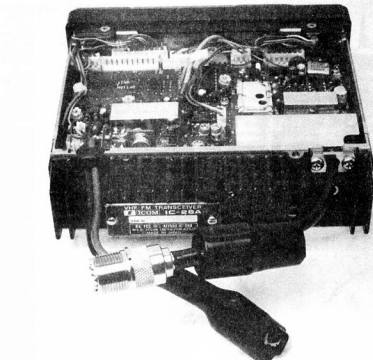
RATING CODE

- * Poor, ** Satisfactory, *** Very Good, **** Excellent

RPH GOING IN-BAND

Radio for the Print Handicapped stations in Brisbane, Canberra, Hobart, Melbourne, and Sydney will be allocated frequencies on the AM broadcast band. (They currently operate on either 1.620 or 1.629 MHz — just above the AM band which ends at 1.606.5).

This decision follows a review of RPH by the Department of Communications. Discussions will be held with RPH licensees to devise a time for the change.



little over one watt of audio power, confirming my earlier remarks for the need of an external speaker.

The overall frequency accuracy was checked as better than 50 Hz, which is the limit of proven accuracy of my counter.

The receiver audio response was checked with the -6 dB points occurring at 250 Hz and 3.5 kHz. The curve between these points was very smooth.

I was unable to do an accurate check on the receiver selectivity due to synthesizer noise upsetting measurements, but it would appear that the specified 12.5 and 25 kHz at -6 and -60 dB would be easily met. Certainly for our 25 kHz channel-spacing there would be no problems at all.

Finally, the receiver current drain was checked. This was 320 mA with the receiver squelched and 600 mA with full audio output of 1 kHz tone. It was noted during these tests, that the receiver performed quite well right down to 9.5 volts, although the audio power output was rather restricted at this low voltage.

The overall performance of the IC-28A is very good with the power output of the transmitter and the receiver sensitivity very well matched.

INSTRUCTION BOOK

The 28 page Instruction Manual is very well printed and presented. Nine sections cover the following:

Specifications, Features, Control Functions, Installation, Operation, Inside Views, Maintenance, Block Diagram and Options.

Section 10 is a schematic diagram which was, in fact, not supplied with the review transceiver. All the operating instructions are clear and easy to follow. There are many drawings showing the sequence of LCD readout displays for the setting-up of the various programming requirements.

With so many good points, it is a pity that Icom did not see fit to include a little technical information. At the time of writing, not even a workshop manual was available and Icom Australia do not know when it will be available.

CONCLUSION

Although the IC-28A is priced somewhat higher

Current consumption at 13.8 volts and high power output was 5.2 amps, with 2.5 amps in the low power position. It is possible that the low power output setting is adjustable as it was with Icom's previous models, but no mention is made of this in the instructions.

Receiver Tests

The S-meter calibration was checked first. The LCD bargraph display has nine divisions up to S9 and five divisions above this for S9+. The following results were obtained:

S1	1.00 uV	2 dB
S3	1.25 uV	2 dB
S5	1.60 uV	2 dB
S7	2.00 uV	2 dB
S9	2.50 uV	2 dB
S9+	3.10 uV	End of Scale

This works out at just one dB per S-point. I often hear amateurs on two metres giving reports to other stations on the basis of six dB per S-point, but as we have seen over the last few reviews, this is just not so. The most that can be said for the IC-28 S-meter is, that it will sometimes tell you if you are receiving a signal, but as may usable signals are below one uV, this will not always be true.

Receiver sensitivity was checked. With the signal generator set at three kHz, deviation with a one kHz steady tone modulation, the 12 dB SINAD came up at 0.2 uV. The squelch sensitivity at the point of threshold was just a whisker under 0.1 uV and with the squelch right off, signals were audible down to an estimated 0.01 uV.

The extension speaker output was terminated with the power meter set at eight ohms. Power output of 2.2 watts produced 10 percent distortion and 2.5 watts, 20 percent. Somewhat more power is obtainable with a four ohm speaker connected. Up to about 3.5 watts with 10 percent distortion. Some comparative tests with an external speaker compared to the in-built speaker showed that it

Learn Morse on your COCO2

Kevin Bond VK3CKB

57 Thomas Street, South Morang, Vic. 3752

A small follow-up article to convert September's program to the TRS80 Colour Computer.

Within a few days of the September *Amateur Radio* being published, I received an interstate phone call asking how to adapt the Morse training program to suit the popular TRS80 Colour Computer 2 (COCO2). The program differences are due to the COCO2 serial output address being 65312 (decimal) instead of 63 for the MC10. The connection of the external oscillator may be tested by typing POKE 65312,0 to turn the tone on, and POKE 65312,2 to turn the tone off. (Press ENTER after each command). This was previously POKE 3,0 and POKE 3,1 for the MC10. Note that the serial output is on Pin 4 and ground is on Pin 3 of the serial I/O connector. Another minor difference is due to the COCO2 having a 6809 processor instead of a 6803 in the MC10. Some instructions are different; eg NOP (no operation) is a decimal 18 instead of 1.

The machine language subroutine is longer by four instructions because the serial output address is a two-Byte number instead of a single Byte and is called up four times, once each at the beginning and ending of the dot and dash. Also, because with the COCO2, machine language subroutines are usually placed to start at hex address 3F00 (decimal 16128), the address of the delay subroutine is now hex 3F24 (decimal 16164) which converts to the two-Byte number 63,36 in decimal. Otherwise the subroutine is the same as before and not worth reprinting.

Line 8 of the listing clears 50 Bytes of memory starting at address 16128 to reserve space for the machine language subroutine. Line 9 again defines the starting address for the POKE statements. Lines 10 to 41 inclusive are the actual dot and dash subroutines. Some shuffling of the instructions has been done to avoid the printout spilling over the end of the line which may have caused confusion.

Line 160 tells the computer to output a dot, and Line 161 a dash at the new addresses. Lines 190, 200, 280 and 735 have been

adjusted to allow for the different execution times of the BASIC instructions of the COCO2. This provides the correct delays between dots and dashes, letters and words to correspond to the examination speed.

Lines 320 and 560 call up the CLEAR key instead of CONTROL-Q to return to the menu in options one and three. Finally, the number in line 2000 has been increased to provide space for longer messages to be typed in on option two. This is possible because the COCO2 has a greater memory capacity of 16k.

Fortunately, I was able to borrow a COCO2 to test and make adjustments to the program. The changes only to the original program are listed and all other lines remain unchanged.

In conclusion, it should be noted that the Morse examination is computer generated, so using a computer for training is very effective.

Figure 1 — Computer Program. This listing shows only the alterations for operation on the TRS80 Colour Computer 2. The original program was published in *Amateur Radio* September 1986 (page 13).

```
5 REM:COCO2 10WPM CW
8 CLEAR 50,16127
9 N=16128
10 POKE N,79:POKE N+1,183:POKE N+2,255:POKE N+3,32
15 POKE N+4,134:POKE N+5,65
20 POKE N+6,189:POKE N+7,63:POKE N+8,36:POKE N+9,74:POKE N+10,38
21 POKE N+11,250:POKE N+12,134:POKE N+13,2:POKE N+14,183
22 POKE N+15,255:POKE N+16,32:POKE N+17,57
25 POKE N+18,79:POKE N+19,183:POKE N+20,255:POKE N+21,32
30 POKE N+22,134:POKE N+23,159:POKE N+24,189
35 POKE N+25,63:POKE N+26,36:POKE N+27,74:POKE N+28,38:POKE N+29,250
36 POKE N+30,134:POKE N+31,2:POKE N+32,183:POKE N+33,255:POKE N+34,32
40 POKE N+35,57:POKE N+36,198:POKE N+37,255:POKE N+38,90:POKE N+39,18
41 POKE N+40,38:POKE N+41,252:POKE N+42,57
160 IF W$="." THEN EXEC 16128
161 IF W$="-" THEN EXEC 16146
190 FOR D=1 TO 40:NEXT
200 NEXT:FOR J=1 TO 65*12:NEXT
280 FOR J=1 TO 510:NEXT
320 W=ASC(R$):IF W=12 THEN 2100
560 IF ASC(T$)=12 THEN 2100
735 FOR J=1 TO 300:NEXT
2000 CLEAR 1000
```

BAND PLAN — 23 CM

Ron Henderson VK1RH
Peter Gamble, VK3YRP

BACKGROUND

The 23 cm Band Plan was devised in 1984/85 by the Federal Technical Advisory Committee (FTAC) in response to a previous Federal Convention motion. It was debated and adopted by the 1985 Federal Convention and published in *Amateur Radio* and in the 1985/86 Call Book. Much effort was put into defining this plan to ensure that it took cognisance of the secondary status of the amateur service, the national and international amateur satellite service sub-band allocation and the need to guard air traffic control radar frequencies.

A review of the band planning process and the existing band plans appeared in several AR articles in January, February and April, 1986. These foreshadowed discussions at the 1986 Federal Convention. Two motions were put forward for discussion specifically referred to a review of the 23 cm band.

The VK5 motion simply noted that "The 1296 MHz plan ignores the restricted frequency availability of commercial repeater equipment." The VK5 Division advised prior to the Convention that they had difficulties with the band plan, but did not provide advice on specific problems.

The VK2 motion was more specific. It noted that the current band plan did not suit the current manufactured range of equipment. However, it recognised the difficulty of staying clear of the Amateur Satellite Service sub-band 1260-1270 MHz and providing a guard band on the radar equipment centred on 1275 MHz. The motion sought a recasting of the band plan to accommodate equipment that was currently in the country and had limited frequency coverage and a 20 MHz repeater split.

The matter was debated at length in committee,

no alternative solution was found and when voted on, the existing one year old plan was adopted unchanged (except for two minor editorial changes).

THE ISSUES

In the AR Band Planning articles it was stated that good band planning should not be compromised by essentially commercial considerations, that is the existence of some equipment types of limited capabilities. It was also suggested that microprocessor control of modern equipment made for flexible operating frequencies and repeater offsets. In contrast to this broad outlook was the pressure of some equipment suppliers to press sales through offers of cheap or low cost repeaters not in accordance with the band plan.

Thus the pressure for change has come not from band planning first principles, but from commercial pressure.

THE ALTERNATIVES

Based on the comments received there appear to be three main alternatives:

a) Change the allocated frequencies to allow repeater operation with a 20 MHz split with repeater operation at 1260+ MHz and 1280+ MHz. This places one set of frequencies inside the international amateur satellite sub-band (shades of channel 40 on two metres) with the other frequencies outside the radar guard band but in the ATV allocation. Both the frequencies and the shift do not accord with the band plan. It is unlikely that the Department of Communications would regard this as responsible band planning and therefore concur with it.

b) Modify the band plan to allow repeater operation in the 1260-1295 MHz segment.

Note that allowance has to be made for an internationally agreed EME segment at 1295-1297 MHz and a guard band from 1295-1300 MHz for the 1300 MHz radar. This would still require the modification of all of the existing non-standard repeater and transceiver equipment for a 12 MHz split. The result of this change would be to cram a well laid out 20 MHz segment in the current plan into a 15 MHz segment. Other segments affected by such a move include ATV, digital, packet and SSB modes. This alternative has not received any support.

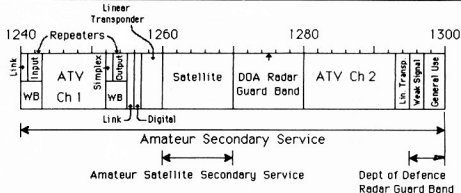
c) Modify the repeater equipment to a 12 MHz split and the frequencies assigned in the band plan. Given that the majority of repeater equipment in use in Australia is either "homebrew" or adapted from various sources, this should not pose a major problem.

This would also require the modification of the existing transceiver equipment to cover the correct band segment. This will probably require the assistance of the Japanese manufacturers, not just the local agents.

The above alternatives lead to the conclusion that the present band plan is the preferred alternative. The inescapable mathematical conclusion is that given the segments to be avoided in the 1260-1300 MHz segment, 10 MHz for satellites and 15 MHz for radar guard bands, a 20 MHz repeater split just does not fit!

Noting that the Amateur Service is the secondary service in this band, it is essential that the band plan be constructed to avoid causing interference to the primary users.

Finally, commercial pressures and technology that has now been on the market for a couple of years should not dictate a band plan for the future.



Intruder Watch

Bill Martin VK2COP
FEDERAL INTRUDER WATCH CO-ORDINATOR
33 Somerville Road, Hornsby Heights, NSW 2077

Welcome to the column. Ulrich Bihlmayer DK9KR, of the DARC Intruder Watch, reports that Radio Tirana (Albania) has vacated the frequency of 14.320 MHz. Transworld Radio (Monte Carlo) has vacated 7.100 MHz, but this station had not given us trouble here in IARU Region 3.

I am, at the moment, preparing the statistics of the Intruder Watch activities for 1986, and they should appear in this column in the April issue. Similarly, I should by then be able to report on who received the Intruder Watch Certificate of Merit for 1986.

Acknowledgments and thanks to the following who supported the IW in November 1986:

VK1GD, VK2s CNS, D.V.W. G Bradford, VK3s AMD, DKE, XB, VK4s AFA, AKX, BG, BHJ, BTW, DA, KHQ, KHZ, VK5s GZ, TL, VK6s JQ, RO, XV, VK7RH, and VK8JF.

There were 308 broadcast (A3E) intruders reported: 190 CW (A1A); 95 RTTY (F1B); 102 intruders were using other modes, and 50 intruders supplied our observers with their call signs. The Woodpecker was heard on the 7, 14, and 21 MHz bands.

Bob Knowles ZL1BAD, the IARU International Monitoring System Co-ordinator, writes that he may be in Sydney around April. Bob is also the NZART IW Co-ordinator, and I look forward to

meeting him if he makes the trip. The only criticism I have of the hobby of amateur radio is that one so very rarely gets to meet those with whom one communicates, and it is always a great pleasure if we get the chance. (I would particularly like to meet those who say they will QSL and don't!).

A reminder that the only stations which can be considered to be intruders from 14.250 MHz to 14.350 MHz are broadcast stations, as this segment of the band is shared.

So we will keep it short this month, and wish you all 73. See you in March.

Know your Second-hand Equipment

TRIO KENWOOD continued

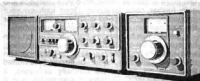
Ron Fisher VK3OM

3 Fairview Avenue, Glen Waverley, Vic. 3150

This month, we will look at some of the better known Kenwood amateur equipment. Certainly the single piece of equipment that put the Kenwood name to the forefront must be the TS-520.

KENWOOD TS-520 HF TRANSCEIVER

Released about October 1974, the TS-520 was Kenwood's answer to the, then popular and well established, Yaesu FT-101 series. At this time, the 101B was "the rage." Up until this time, the Trio Kenwood line had not enjoyed a great reputation in Australia and it appeared that the TS-520 was an "all-out" effort to capture a fair share of the market. It did just that and Kenwood have gone on from success to success.



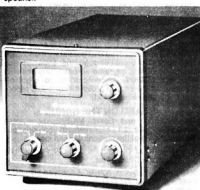
In concept the 520 closely imitated the 101 series — it had full coverage of the normal 80 to 10 metre amateur bands with a push-button selected, fixed tuned WWV position for calibration purposes.

The circuit was fully solid-state, except for the transmitter final stages which used a 12BY7 driver and two 52001/6146s in the final. A double conversion set-up was used with the first IF at 8.895 to 8.295 MHz. The second IF at 3.395 MHz employed a crystal filter for SSB, plus a position for an optional CW filter. All of the extras were included as standard, except the CW filter. These included a quiet cooling fan, a simple, but effective speech processor, crystal calibrator and VOX, and a 12 volt DC/240 volt AC power supply which was built in.

In terms of performance I have always considered that the 520 was better than the 101B. The 520 had a slight problem with the front end overload, but this was certainly not as bad as the blocking in the 101 series. Also, the audio quality on both transmit and receive was superior to the 101 series, with much less distortion on receive.

Transmit intermodulation distortion was less with the 520 due to the use of 6146-type final tubes. It is worth noting that, while the original 52001 final tubes can be replaced with 6146s, I have found that the S2001 will work much better with higher output on 15 and 10 metres. They are hard to find, but well worth the search.

A range of optional matching accessories were available which included an external VFO and speaker.



New price of the TS-520 transceiver was \$550, in December 1974. Secondhand value for a 520 in a clean and unmodified condition today would be about \$375.

The external VFO was priced at \$99 and the external speaker was \$26. Secondhand value today would be about \$75 for the VFO and \$20 for the speaker. A matching two-metre transverter was available somewhat later in the run. This had an output of 10 watts on SSB and a 1 uV/10 dB S/N ratio on receive. New price in 1976 was \$240 — secondhand value would be about \$120 today.



The TS-520 with DG-5 and VFO-520.

KENWOOD TS-520S

This updated version of the original 520 was released about September 1977. Appearance was very similar to the 520 with the dial area somewhat cleaned-up on the new 520S. Frequency coverage now included the 160 metre band and the WWV position was selected by the main band-switch. The transmitter final tuning control was fitted with a vernier drive, but the DC power supply was an option and not included as standard as it was with the original 520.

The general receiver performance was much better, with very satisfactory front-end performance. An external digital frequency display, the DG-5, was an optional extra that could be plugged directly into the 520S. It should be mentioned that the DG-5 could be used with the original 520, but this required a modification kit for the 520 which is probably no longer available from Kenwood in Sydney.

The DG-5 could also be used as a 40 MHz frequency counter.

The 520S established itself as one of the most popular secondhand transceivers around and will provide excellent overall performance at a reasonable price.

New price of the TS-520S in September 1977 was \$550. Secondhand value today would be about \$425 for a clean unmodified unit.

The DG-5 is another story. The new price in November was \$169, however, it proved to be a rather troublesome device. It seems that the soldering was rather suspect, but eventually most of the problems were sorted out and a good DG-5 is now very hard to find. (The DG-5 'Wanted-ads' are usually in excess of the DG-5 'For Sale-ads'. Secondhand value today would be about \$150.

KENWOOD TS-820 & 820S TRANSCEIVERS

These were actually released prior to the 520S in January 1977, with the 820 being the Kenwood flagship. It was closely related to the TS-900.

The 820 was a single conversion set-up with an 8.830 MHz IF. The VFO, which operates at 5,000 to 5,500 MHz, fed a PLL controlled system to produce the required heterodyne frequencies.



This was one of the first transceivers to provide an IF shift facility. Although this did not actually alter the selectivity, it did enable interfering signals to be removed to outside the receiver bandpass — a very useful feature.

On the transmit side, an RF speech processor, which operated at 455 kHz, gave a useful increase in average output. The digital readout was not originally a standard feature. It was available as an option in the earlier models, but the later 820S came with the readout installed as a standard feature. It is unusual to actually find an 820 today without a digital readout.

The analogue dial scale was an excellent feature, a little like the old HRO or AR7 dial, where the first or 100-digit changed as the scale rotated. Special attention was paid to the transmitted signal quality. RF negative feedback applied from the final stage to the driver stage produced very low inter-modulation distortion. This was the first transceiver to use this feature since the Collins company had perfected it in their amateur equipment during the late-50s.

The final-stage employed a pair of S2001 tubes and the same remarks apply as for the 520 series.

All-in-all, the 820 is an excellent transceiver which is capable of producing results on a par with the best available today. Perhaps the only point of criticism is the overall selectivity. The filter is a little on the wide side for the dedicated DXer.

Various modifications are available including upgraded filters, filters in tandem, etc — take your pick or leave alone and enjoy the smooth, normal performance.

In use the 820 has an excellent record of reliability. Initially a few problems came-to-light in the digital display, but generally a new pair of final tubes every few years is all that is needed.

In the servicing department the RF processor is liable to drift out of tune over a period of time but this is an easy thing to put right as the adjustments can be monitored by using the built-in transmit monitor facility.

The price of the TS-820, including the DG-1 Digital Display, when new in early 1977, was \$980. Secondhand value for an 820 with digital display, or an 820S, would be about \$575 today.

Next time, we shall look at some of the early Kenwood two-metre equipment.

If there is a particular piece of equipment you would like to see presented in this segment please write to the address at the head of the column. Also, if you need more detailed information on any of the pieces covered here, again please let me know — I may be able to help.

COMPUTERISED BUSINESSES

The National Institute of Labour Studies says one in every six Australian businesses is computerised. And about one in 10 workers are expected to have computer skills. In 1960, there were only an estimated 34 computers in Australia.

Today, computers control our banking, shopping, education, and even fuel consumption. The market for professional business computers is booming.



How's DX?

Ken McLachlan VK3AH
Box 39, Mooroolbark, Vic. 3138

TIME TO MEDITATE

After completing my notes for January 1987, in early November, I was fortunate not to become another road statistic shortly afterwards.

I was hit whilst driving my own vehicle in the middle of the day and later waking up in the intensive Care Unit of a Melbourne hospital. Next day, on coming to my senses, I felt and looked like I had been subjected to a mad plumber, electrician and seamstress, with metres of tubes of varying diameters, thread, wires connecting high-technology equipment to my body.

Being unable to speak and having to print (due to my poor writing) my requests on paper, all was explained to me. Such things as arterial transfusions through the chest of blood, dextrose, analgesics, antibiotics, sedatives and nebulised oxygen, antibiotic and other drug lines from the respirator were passed through the nose and throat. All were electronically controlled on a calculated dosage to exacting tolerances, backed up by a myriad of wire sensors to a very elaborate computerised system, so sensitive if one clenched their fist an alarm would be activated. One felt they were in a fish bowl, being the object of so many watchful eyes, backed-up by the constant attendance of a fully qualified ICU staff member.

The equipment was very sophisticated electronically, some bearing the logos of well-known amateur electronic equipment manufacturers. All units were fitted with battery back-up in case of power failure and heavy voltage stabilised against fluctuations, particularly those from the radiography department which was constantly in use. One wondered, after many days of this treatment, the effect of Radio Frequency Interference and its effects, if it got into the delicate equipment.

One of the staff pointed out that only certain televisions could be allowed in the hospital as some caused erratic behaviour in the systems. These devices generated GDM on the BC and FM bands, likened to the Woodpecker, on a "walkman" cassette/radio.

The ugly question reared its head; "What havoc to the equipment could an amateur or other RF transmission of within say a kilometre, cause?" As an unwitting guest, with no chance of leaving, I was concerned, and even more so when transferred to another hospital's ICU, which had more up-to-date, state-of-the-art technology and was located adjacent to the visitor's car park.

I know many members are involved in medicine and medical technology and perhaps they may be able to enlighten all readers on the subject with an article for the magazine.

I am happy to say that my prognosis over the next few months looks good, yet slow (by my standards), and I have to look forward to many specialist appointments, the complete return of my voice and mannerisms to their vitriolic past and being a witness in pending police litigation.

Thanks must be extended to all who helped my wife during, what was a trying time for her, and to the many friends who volunteered help. It is when the "chips" are down one realises who their friends and true helpers are.

Briefly, sincere thanks to one and all for the multitude of cheery cards, numerous telephone calls both to home and the hospitals. All were greatly appreciated — the card with over 200 names and quite a bit of talking post with hospital staff and — did the rounds — many words — brightening the dull and dreary weeks.

A compatriot of many years, Jim VK3YJ, whom I have unfortunately never met, has written some of this column to assist me. Your thoughts and your wife, Anne's, typing are much appreciated. Jim.

TECHNICAL INSTITUTE OF RADIO

At a meeting of members of TIA on October 1, 1986, Rashad Jalal VK1AA, announced his resignation from the Presidency of TIP. Members acknowledged that Rashad was the founder of

amateur radio in Syria and was its first licensed operator in 1946. Rashad has promoted amateur radio over the past 40 years and members accepted his resignation with great regret.

Members decided to ask Rashad remain as an Honorary Chief of TIP for life, and intend to celebrate his 40 years with TIP by a special call sign. The celebration will take place from December 25-31, 1987. We will take the form of four stations using special call signs as follows: Rashad 6C40TIR

Omair 6C40D

Michel 6C40M

Hikmat 6C40RJ

New Office Bearers are: President — Omar Shashigh VK1AC; Vice-President — Michel Sioufi VK1AK; Secretary — Hikmat Zuhdi YK1AM. New Headquarters and QSL Address: PO Box 245, Damascus, Syria.

Omair VK1AO, was born in 1936. He received a PhD in telecommunications in 1977 and a BScEE in 1985. He has a deep knowledge of all aspects of communications and until recently was a senior researcher, before opening his own computer business. He has had several books published including one, in Arabic, about amateur radio.

—Contributed by Hikmat Zuhdi YK1AM and Omar Shashigh VK1AO

FOOD FOR THOUGHT or how true?

On reading the *Papakura Radio Club Newsletter*, the astute Editor, Dave ZLIAMN, commences the December issue with some very pertinent comments, which I feel are worth reprinting to create a *Think Tank* amongst some of our amateurs.

"Why do so many people, who went through the work to obtain a licence, leave the ranks of this association?"

"It does seem odd that people exposed to what amateur radio has to offer would let their licences lapse when one of the most 'safety factor' items is a hand-held two metre rig under the car seat."

"Could it be that the newcomers meet coldness when they go to their first meeting at an amateur club? From a group of people who delight in talking about what a fine bunch of people amateurs are — what is the problem?"

How many of us, as SWLs, Novices or Full Call amateurs have visited a club and come away not meeting another person with the same interest or, in some cases, not meeting another person, even though they have sometimes been introduced as a newcomer? How many amateurs have tried to join a net only to be ignored? How many newcomers with a spanking new 'hours old' licence have been ignored or lectured at length as to the correct procedure to join a particular group? It happens in all hobby meetings, including ours, a hobby of communications. Ladies and gentlemen, be adventurous and welcome that new acquaintance as a friend. He or she has gone to the trouble of seeking your companionship, surely it is common courtesy to be reciprocal or they will not embarrass themselves by trying again.

SOUTH SHETLANDS

Listen for CX0XY, on all bands early this month. The exact date is dependent on the services of the Uruguay Air Force and weather conditions. The cards have been printed and the authorisation has been granted by the authorities, as copies were kindly sent to me by the Montevideo DX Group. QSL to CX2CS. Good luck to the group and those VKs that want King George Island.

DISAPPOINTMENT

Iris and Lloyd, the *Globetrotting Colvins*, were unable to obtain a 3B8 or 3B9 licence. Unfortunately, this couple, were subjected to unnecessary interrogation and foundationless innuendoes. Not good for such a dedicated couple and our hobby. Even the authorities denied requests by 3B8DB to operate as 3B9DB.

NEPAL

It is on the cards that Nepal will be relaxing come

of its stringent licensing conditions in the near future. Many amateurs are responsible for this change in attitude, but Father Moran 9N1AM, the crusader of the hobby in Nepal for decades, leads the list, by his attitude, assistance and dedication to having our hobby being seriously recognised by the authorities.

PETER 1 ISLAND

Congratulations Bob KDP7, for your tenacity in getting permission to operate and the assistance of overseas publications, who spelled your problems out in words of one syllable. At the time of writing these notes, it is unknown if you made it. If you didn't, commiserations, if you did and only made even one contact, congratulations. Your integrity, in my opinion, is beyond reproach, in the way that you handled the whole project. Perhaps a few more amateurs could help your methods and gain further considerations. Good luck on your impending operation and whatever you decide for the next season, whether that venue or another.

A well-known Norwegian DX club, of which I am honoured to be a Life Member, is contemplating, with others in that country, placing a contingent on the island early this month, or earlier. It is hoped that they do and, once officially activated, it becomes a DXCC Country. If successful, it is a shot-in-the-arm for DXing and, hopefully, the commencement of an upward trend in the Solar Cycle.

This will be a costly operation if it comes to fruition and it is anticipated that the operators will take no preferences in countries, call signs, nets or bands in a five or six day operation. So it will be a case of the best operators and not a case of *mate rates*. Is this not what the hobby is about, anyway?

HEARD ISLAND

Frank VKODA, a Commonwealth of Australia Meteorological Observer, has done a sterling job from the area of Big Ben, a continuously active volcano and the highest peak on Australian owned soil, considering the other duties he has had been continuing further down into the colder regions. It is hoped to hear you later in the year Frank, time and energy permitting!

CHRISTMAS ISLAND

It appears Ron ZLIAM, had a good time from the area and please QSL direct or via the Bureau to his home call. Ron, may have a surprise in store for those in need of another rare VK possession in the near future.

TEN & FIFTEEN — NOT HIBERNATING!

Do not overlook these two bands, they can create some surprises at very odd hours that never appear in the predictions. A CQ call at various intervals and frequencies can be very rewarding with S9, QRM free signals (for a short duration), if no one calls, no one is heard!

FRENCH ANTARCTIC ISLANDS

This year, if looks as if there will be active amateur operators on Crozet (FT8WA), Kerguelen (FT8XD) and Amsterdam Islands (FT8ZA) at the same time. Quite unusual, but not really unexpected.

DIPOLE & 100 WATTS

Jock VK1LF, has proved that persistence and good operating can break through the kilowatts and beams. Recently, he came across a dog-pile with Rick KH6JEB/KH7, to prove it. Jock got his contact and the K7, underneath it. Jock's report. The Q5, is the secret Jock!

HEARD ON THE BANDS

Joy VK2BX and Steve VK2PS, considered November was an improvement on previous months. Some of the stations worked include:

15 mates — DJ, DK, DL, F6, GD, ON, PA, UL, UV and UX on the DK9KE Net.

20 mates — 5W1FM, A71BK, CE3CYM, CP5LE, KF8FA, G3HCQ, G4YLO, I5YBZ, KX6AZ, OK2BB, OK3TMM, VE7YL, VE7CBK, and

^{*} denotes CW operation.

Please, under no circumstances, address any mail to Les Samson 7Q7LW, or his wife at their Call Book address. All mail to go to Mrs Helen Samson, 57 Millford Court, Brighton Road, Lancing, Sussex. BN15 8RN, England.

JA is reissuing non-renewed call signs ** Vlad J5WAD is now home — please QSL to UB5WAD via the bureaus. UA4PW ran out of cards and apparently W6CNA hasn't got copies of the current logs. ** Gerben PA0GAM a consistent

are various reports of him having very few takers.

There is a strong belief among some members, but not all, that

become a new DXCC Country. So folks, save your

accept IBCs. ** John Litten ZL1AAS is the new

When Ken had his unfortunate accident, I was

Percy VK3PA, the doyen of Australian DX net

SWI Inc. — the cost

Recently, it was brought home to me, quite

By average of the above cards received for

I am seriously considering the validity of a

I look forward to other amateur's comments on

001 000000

I have noticed, of late, a practice which seems to

SKINWORKERS AND HEARD

VK0DA — Frank should be clear of Heard Island

After this effort, plus previous expeditions, no

FH/W6KG — Iris was heard from Mayotte, one of

PK 4573

With the amount of newer amateurs, both Full Call

Several of the local DX nets give the newer Full

To prove a point, during the last sunspot high,

Easter Island was described to me by the late



times later that evening, it was noted that the weather conditions matched the area designated by the operator, but the vessel and registry could not be found when records were searched. Unfortunately, their fate will always remain a mystery.

CW SWLing with Eric L30042/L5



VHF F

— an expanding world

Eric Jamieson VK5LP
1 Quinns Road, Forrester, SA. 5233

All times are Universal Co-ordinated Time and indicated as UTC

AMATEUR BANDS BEACONS

FREQUENCY	CALL SIGN	LOCATION
50.010	JZ1GJV	Mie
50.080	KH6EQI	Honolulu
50.075	V56XJ	Hong Kong
50.109	JD1YAA	Minami Torishima
52.013	Z5BPL	Lota Island
52.020	FK8AB	Noumea
52.100	ZK2SIX	Niue
52.150	VK6SJ	Macquarie Island (Keyer)
52.200	VK1VF	Darwin
52.250	ZL2VHM	Manawatu
52.310	ZL3MHF	Hornby
52.320	VK6RTT	Wickham
52.328	VK2RHV	Newcastle
52.335	VK4ABP	Rockhampton †
52.350	VK6RTU	Kalgoorlie
52.370	VK7RST	Hobart
52.420	VK2RSY	Sydney
52.425	VK2RGB	Gunnedah
52.440	VK4RTL	Townsville
52.450	VK5VF	Mount Lofly
52.460	VK6RPH	Perth
52.465	VK6RTW	Albany
52.470	VK7RNT	Launceston
52.485	VK6RAS	Alice Springs
52.495	VK6RBS	Busselton
144.400	VK4RBB	Mount Mowbruan
144.410	VK2RSJ	Canberra
144.420	VK2RSY	Sydney
144.430	VK3RTG	Glen Inverleary
144.465	VK6RTW	Albany
144.470	VK7RMC	Launceston ‡
144.480	VK1VF	Darwin
144.485	VK6RAS	Alice Springs
144.550	VK5RSE	Mount Gambier
144.565	VK6RPH	Port Hedland
144.580	VK6RTT	Wickham
144.800	VK5VF	Mount Lofly
144.950	VK2RCW	Sydney
145.000	VK6RPH	Perth
145.057	VK6RBS	Busselton
432.160	VK6RPH	Nedlands
432.410	VK6RTT	Wickham
432.420	VK2RSY	Sydney
432.440	VK4RBB	Mount Mowbruan
432.450	VK3RAJ	MacLeod, Melbourne
432.535	VK3RMB	Mount Buninyong
432.540	VK4RAR	Rockhampton
1296.110	VK6RBS	Busselton
1296.420	VK2RSY	Sydney
1296.480	VK6RPH	Nedlands
10300.000	VK6RVF	Roleystone

1. For some reason, VK4ABP has not been listed for a while. I was reminded of this during a six metre opening by Alan, the custodian, so is now included.

2. Advice via six metres has been received of a new beacon, VK7RMC, located in Launceston, which is currently going through its testing stages. By the time you read this it could be operational. It will be the first two metre beacon from Tasmania. Details later.

THE SUMMER Es SEASON

Where does one start? My predictions last year for another bumper Es season in 1986 have proved correct. It has so far (to 21/12) been nothing short of truly remarkable. Not only has it been marvellous on six metres, but the two metre coverage has been nothing short of fantastic and traditionally the best period is yet to come being between Christmas Day and January 1. It is a little early to tell yet until reports come in, but it seems the two metre coverage of Australia may be even greater than last year and that would be saying something. I can't see that I have to draw another map for the March issue as I did last year!

SIX METRES

It doesn't seem necessary or required that I should give a blow-by-blow description of all that has happened, perhaps the highlights should be mentioned. No matter what I say there will be more important events I have missed. I will do the best I can.

The earliest recorded contacts at this QTH were on 10/10 to VK4ALM, and a number of others. Then during the next 21 days, until the end of October, the band was open on no less than 12 days, mostly to VK2 and VK4. As November progressed the contacts began to increase, with VK2, 3, 4, 5, 6, 7 and ZL being quite common. 18/12 was a particularly good day with VK2, 3, 4, 5 and 6. One good contact was to Jim VK3AZY, on backscatter at 5 x 5, but without the customary warble. Roy VK5AXV, from South End, was another good backscatter contact. VK4JH reported working VK8, ZL and two JAs. VK4ALM reported hearing FK8EB on a beacon on 50.500 sending FK8AB/B then a string of dots. ZK2AAZ on 52.050 was heard in New Zealand around 2100 and was reported working ZL1TRM, ZL1AKW and ZL1AUR. FK1TZ also heard ZK2AZ. KH6 was heard by FK8EM and FK1TK, but no contact made. VK5ZBU heard VK0SJZ beacon on 52.150 and VK5ZLX was observed calling VK0SJ. On 19/11, ZL2TZA worked ZK2AAZ. After the big splash the band went a bit quiet and we had to be content with VK2 and VK4 contacts!

On 2/12, VK6KXW worked FK8EM and that's a long haul by any standards. 3/12, VK3AMK heard VK4 stations calling 5W1GA (Neville VK4ZNC, DXpedition), then on 4/12, the VK8 stations started getting into the band. On 5/12, VK6KXW at 0620 by VK5FT. At 0640, the VK6RAS beacon was S9, but no VK8s could be aroused! Then VK6GF worked ZK3ATN/3 while using only a dipole. YJ8 and ZL were worked from Adelaide. So already the pattern was being set for something really big to occur.

And occur it did on 5/12. At 0140, VK5LP worked ZL2BKC (10 W) and ZL4TBN (15 W), and the latter reported having already worked VK2, 3, 4, 5 and 8, 0356 VK2ASZ worked 5W1GA who reported working six stations so far that day. VK2 stations reported the band open to practically all areas of VK and ZL, including two metres to some areas. On 6/12, VK6KXW worked VK0SJZ 5 x 9 at 1045. 8/12, open to VK7. 10/12, another good day with most Australian stations available up and down the country.

12/12 was good. VK5RO heard 5W1GA and ZL1BHX contacted ZK2 and VK8. Lots of ZLs around today. VK5LP working VK6AOM at Esperance with signals S9 +40 dB when ZL2AQR broke in and had a 5 x 8 meter over both ways with the 5LP beam still pointing west! It would have been interesting to have turned my beam to see how strong Dick was. VK6AOM also worked him. Dave VK6AOM, reported hearing FK25A at 0505, at 0545 VK2FMB worked FK25A at 5 x 3.

13/12 was a good VK6 day with lots of contacts. A filter altered through that a VK2 had worked into Indonesia as well as 5W1GA (I thought Indonesia had no normal six metre allocation). Band open from VK5 to VK1, 2, 3, 4, 5, 6, 8 and ZL1 and 2. 17/12 also a good day, with VK5RO working FK25A. 18/12 also a good day, it had to be as the VK8 beacon was S9 at 0405. At 0330, VK6ZKG/7 was 5 x 9. At little later it was over to both VK2s and 4s. At 0604, 3D2ER (Neville VK4ZNC) came through and worked by VK5LP at 5 x 3. 0911 VK5DK, from Mount Gambier, was 5 x 5 so promptly worked him on two metres at 5 x 9. At 0620 3D2ER was peaking 55/6 and could be heard working many VK1s, and 3 stations with stronger signals. At 0630, VK6KXW reported he heard in VK6 at 160 km south of Perth which would be an even longer haul than the FK contact reported earlier. 3D2ER was around for a long time, Mick VK5ZDR worked him at 0427 and he was still audible, though weak, at 0700. 3D2GA also worked by VK7JG and others in Tasmania.

The band went quiet on 19/12. On 20/12, opened to VK6, VK8 and VK2. The stereo

sideband from Channel 0 in Brisbane comes up nicely on 52.000 MHz and with the signal peaking to 60 dB over S9 provides plenty of monkey chatter up to 40 kHz into the six metre band. Quite a nice companion for us to have — still we were told it would not cause any harm to us! So much for that.

And now to 21/12. What a day! Open all day to VK8 as well as VK3, 4, 5, 6 and ZL1, 2, 3. The band looked as though it would be good because Neil VK8ZCU, at Tennant Creek, was 5 x 9 at 0129 and the band had already been open for hours. Contacts to VK5LP followed with VK8ZMA and VK8ZLX, which culminated in a very long alertness and trials for two metre contacts. Dave VK6AOM, from Esperance, spent a lot of time at S9 from 0318, while Alan VK4ABP at Rockhampton, pounded in. Sandwiched in amongst the strong VK8s I found VK3DUQ and VK3KK and worked them around 0657 at 5 x 9. Les VK3ZBU, was also very strong but this appeared only to be a short duration opening as they were gone in a short time. The ZLs were very strong, well over S9 most of the time. Roger VK5NY, worked 3D2ER and 3D2MR around 0235, the latter being with American accent and on the same frequency as New 3D2ER. He may have used his own gear but I never activated by Neil's presence. Signals peaked to S9. VK4ZNC reported he had worked into FK and 3D2 today. ZL1TZA said he had worked all VK states except VK7. The signals from the ZLs were very strong around 0800 causing more tries for two metre contacts. The VK8s were still pounding in as late as 0900. Quite a few operators would be feeling exhausted from the continuing attempts at two metres with quite a degree of success, but you will need to read the two metre section which follows to learn what transpired!

TWO METRES

As I said earlier, two metres has been truly fantastic. Quite apart from the semi-regular contacts between VK5RO and VK5ZDR to VK3 stations, via tropo, Dave VK6AOM, set the ball rolling on 28/11 when he worked 10 stations in VK3 and six in VK5 on 144.1 tropo. Earlier, on 24/11, VK5NY had heard the VK1RCR beacon at 1509 on tropo for the first time. Roger VK5NY, also reported considerable success on 144.2 to Keith VK3AHJ and Rance VK3JG, who reported using aircraft enhancement around 2230. However, they have been unsuccessful using 70 cm.

There were a few spasmodic reports of Es two metre openings between VK3 and VK4 early in December. At 0917 on 10/12, VK4ZSH advised me that VK4 was working VK3 and VK5NC on two metres, which was probably one of the first substantial openings. Col VK5JG reported working ZL2TIC at 5x/3 on 5/12. It was then on to 13/12 when Jim VK5ZMJ, had an opening to VK4 — Rockhampton and Mackay at 2340. There was a good Es opening to Perth at 0848 for half-an-hour when nine contacts were made by VK5RO with signals to S9. Also included was VK6AOM at Esperance. (VK5LP always seems to miss these openings — I have never yet worked a Perth station on two metres!)

Another important day was 18/12, when VK4 worked VK7 throughout the day while VK5ZMK opened his account by working five VK4s between 0630 and 0730. Several other VK5s were involved in openings. (VK5LP always seems to miss these openings — I have never yet worked a Perth station on two metres!)

21/12 had to be a good two metre day. It started with early contacts to VK8 on six metres with signals S9 +40 dB much of the time. At 0140, VK8ZLX was heard calling VK3NM and both parties were picking up bits of the contact, but not enough to make it a two-way. At 0156, VK8ZLX

worked VK2DDC at Albert, a little place west of Narromine, in central NSW, at 5x9. Then Les VK3ZDZ reported hearing the beacon VK6RAS and at 0257 plus 40 seconds VK8ZLU was heard in a three second burst on 144.080 by VK5LP at 0358. VK5NY worked Neil VK8ZCU, on Tennant Creek, at 5x5. A little later the VK8s were kept busy around 0521 working a string of VK2s, including VK2DZV, VK2ZJR, VK2ASI, VK2ZAB and VK2ADY. A number of the stations worked in the same time period, but stretching down towards the Sydney metropolitan area outer limits. At 0630, VK2DDC was again worked by VK8 stations and when ZL1TZA flashed a report that he was hearing VK8 in ZL the VK8s wondered if it would ever stop.

The VK8s had been under constant pressure from several of the VK5s (VK5NY, VK5ZDR, VK5RO and VK5LP) to try and complete the path between the two States, but to no avail. Keys were running, CW signals sent, SSB used, but to no avail. Apart from constant pings nothing else eventuated but VK5RO did work VK8ZCU. All the while VK8ZLU and VK8ZMA continued to pound in on six metres. In between the VK8s grabbed contacts into other States, but the VK5s generally were not given any real treats except the contact between VK5NY and VK8ZCU.

The bonus of course, which does come from this frenzy of activity, is that the whole country has been alerted to the possibilities of two metre contacts and all those with reasonable capability will have their two metre equipment at the ready, so the next week or so should see these contacts continue and possibly on an even greater scale. Did anyone ever need more proof that Es is best at the low part of the cycle and with this statement of best goes the increased chances of two metre contacts.

VK5LP will be operating portable again this year between Christmas and New Year from Meningie, which is south-east of Adelaide, from a small hilltop with a virtually clear horizon in all directions. The hill is about 16 km inland from the coast and has no power line hsk, no vehicle QRM, no TVI, no close amateurs, nice level site, short feedlines to the antennas, what more does one want?

This is all leading me to the point that I think one should be sparing some time during peak two metre activity to examine 70 cm and see if there is any improvement at a distance. At the time of the band. Such an examination would be impossible from my poor home location, but the immense improvement of the portable site would lend itself to some evaluation of the 70 cm scene. The biggest problem will be to find someone who, at the peak of two metre activity, and being called by so many stations, would be prepared to go and try on what VK8ZCU proved to be a dead band! I will try and give you a report.

LATE ITEMS

In the two metre summary, I forgot to mention I received a short call from VK8ZLU, at Saturday 20/12, in which he told me of the great two metre opening on Es to Perth from Alice Springs which commenced at 0525. Signals were mostly 5x9+ and the stations at the Alice Springs end were VK8ZLU, VK8TM, VK8GF, VK8JTJ, VK8WAT and VK8ZMA. Peter worked VK8KRC, YU, UD, HK, UZ, ZKO, RO, ZK, ZRY, CX, YS and AKT. Peter also had a brief contact with VK8YS via the Perth Channel 2 repeater. At the time, six metres was good, but not extremely strong, Peter said. He also passed on a comment he heard, that someone in VK6 had worked a VK7 on two metres, but this could not be confirmed. In the light of these contacts is it any wonder the VK8s were on their toes the next day (21/12)?

A phone call from Wally VK8ZLU, on 21/12, told me that from 1700 to 1800, on Macquarie Island, was being heard there. VK8HK reported it at 0800 or earlier and through to 0936. This was confirmed by VK6WD. Unfortunately, I could not advise Wally of any way that Sojo on Macquarie could be alerted in time for the message to be worthwhile, so the opening had to pass without contact. Pity. The same situation exists with Mark VK8QAC, and the Mawson beacon. He has no way of reaching the island and unless his is dedicated enough to sit there for hours on end listening to a

dead band a contact will eventuate purely by chance. In the case of David VK8CK, he used to monitor the ZL 17 station and also listen for beacons, but not everyone is as dedicated as that!

50-54 MHZ DX STANDINGS

DXCC Countries based on information received up to December 15, 1986. Cross-band totals are those not duplicated by six metre two-way contacts. Credit has not been given for contacts made with stations when 50 MHz was not authorised.

Column 1: Six metres two-way confirmed
Column 2: Six metres two-way worked
Column 3: Cross-band (6 to 10) confirmed
Column 4: Cross-band (6 to 10) worked
Column 5: Countries heard on 50 MHz
Column 6: Countries heard on 52 MHz

CALL SIGN	1	2	3	4	5	6
VK8GB	42	42		13		
VK2BA	29	29				
VK4ZJB	28	28			4	
VK2DDG	25	26		2	12	3
VK3OT	25	26		10	3	
VK2QF	25	25				
VK2VC	24	26				
VK3AWY	22	22				
VK2BNW	20	21				
VK5LP	20	22		6	3	
VK3XQ	19	20		1	1	
VK4ALM	19	19				
VK3AMK	17	17				
VK4TL	17	17				
VK9XT	17	21				
VK7JT	17	18		2		
VK3NM	16	17				
VK3AJU	16	17				
VK4ZSH	15	16				
VK2ALH	14	14				
VK3ZZX	12	13				
VK9YT	12	14				
VK6OX	10	10	1	1		
VK6RO	9	9	3	3	2	3
VK4KHZ	8	10				
VK6HK	8	13		3	2	
						OVERSEAS
JA2TTO	48	48			6	

The minimum number of countries confirmed for an operator to commence being listed is five, including VK.

The position on the list is determined by the number of confirmed contacts. Where two or more operators have the same total, those first date listed with that total can only be displaced by someone having a greater number of confirmed contacts.

The next list will appear in August 1987, and entries will need to be on my desk no later than June 15, 1987. Claimants are reminded that full details of all contacts are required; viz date of contact, time in UTC, call sign of station worked, country, mode, report sent and received, QSL sent and whether received, split frequency contacts should be indicated. Please add your own call sign and date of your claim.

I reserve the right to ask any claimant for QSL cards for perusal to support verification if considered necessary. Further entries are invited.

Steve VK3OT, has asked for his operations on Christmas Island, as VK9XT and Cocos Island, VK9YT, to be included and sent the appropriate applications, and these have been added in their appropriate positions in the table.

The stations worked from Christmas Island as VK9XT were:

Australia — VK4RO, VK4JH, VK4ZBJ, VK8GB, VK8VV, VK8GF, VK8ZBV, VK6OX; Christmas Island — VK9XI; Cocos Island — VK9ZYU; Thailand — VXS1WR; Ogasawara — JAUD1; Marcus Island — JD1BAF; Philippines — DU1GF; GPNTRDUJ; Hong Kong — VS6EG, VS6FX, VS6AB, VS6EZ and VS6SX (beacon); Indonesia — YBICS, YC1BIM; PNG — P29FZS; Saipan — KHA0B; Guam — KGDG, KG6JD, KG6JS, etc; Solomon Island — H44PT, H44DX; Japan — Japanese contacts approximately 6000; Korea — HL2JD; New Caledonia — FKBCR. Total 17 confirmed, 91NBMK and 457DA heard. Total 1980; VE1ASJ beacon heard 1986 on 15.8.80; KX6BU beacon/never heard 1415 on 18.3.80. Total of four

not confirmed making a total of 21 countries.

On another occasion when space and time permit, I will include his listing for VK9YT and they are both very interesting, giving us some idea of call signs and the countries from which they originate.

The list submitted by JA2TTO, was published in the September 1986 issue of AR.

It may also be of interest to readers to know that the Australian Six Metre Standings are picked-up and indexed in the monthly list prepared by Bill Tynan WX30, in his *World above 50 MHz* column of QST. There are 420 call signs on Bill's list and our top performer, Graham VK8JB, is number 116. VK2BA 225, VK2DDG 226, VK4ZJB 237, VK3OT 261, VK2QF 265, VK2VC 276, VK3AWY 292, VK2BNW 306, VK5LP 312, VK4ALM 320, VK3AMK 332, VK4TL 333, VK3NM 335, VK7JG 336, VK3AJU 337, VK4YX 339 (not on the Australian list), VK4ZSH 344, VK3AQR 352 (not on the Australian list), VK4ZAL 356, VK6OX 372, VK3ZZX 378, VK4KHZ 379, VK6RD 382 (not on the Australian list), and neither is VK2ZDI at 399. Place number one is held by JA4MBM with 79 countries confirmed and 81 claimed. On this list also, are marked 154 stations who claim to have worked 40 continents on six metres. It would be interesting to know how many have actually worked Australia, which, after all, is the sixth continent — not Pacific islands or New Zealand!

The way the two metre band is shaping-up, it seems it may be worthwhile starting some form of listing for that band. Maybe this could be done using locator squares as we are unlikely to have masses of overseas contacts on that band due to our relative isolation. I am prepared to look at any suggestions which come from readers and will leave any decisions for a few months.

EME REPORT

Doug VK3UM filed the following report after managing to get back on the air after a major flame-out of his 4CX250B amplifier in the first half-hour of operating.

2211: 1545 WGBJ 449 449; 1600 VEC3RU 549 449; 1625 K2UW 449 449; 2135 DJMBX 439 449; 2145 OK1KIR 339 339; 2200 D9UBV 0 or 0; 2225 F2TU 0 or 0; 2240 FH3FH 0 or 0. Doug was receiving 10 to 14 dB of echoes, however, even this does not necessarily mean conditions will be good to Europe and USA.

On 21/11, at 2145, Doug had a random contact with YU1AA 449 449, but the good results were due to the station having a dish with polarisation rotation.

2311: Very poor conditions. Libration fading, so unusual and vicious Faraday rotation making operation so difficult. There could be a burst of signal for a minute then nothing further for 20 minutes. At 1645, he worked K2UYH 449 449 then dropped out. Signals could be strong, but unintelligible. 1730 VK5MY M M, 2220 VK5MY M M tried with almost nil results, the station was working F2TU. May December be better for you, Doug.

IC-551 NOISE BLANKER

The modifications to the noise blanker were given in Good Tech today with the resistor 5x + 20 dB with the blanker off and 50 or zero with the blanker on. So far I have found nothing objectionable from the modification. Sometimes, a very strong station nearby can get within the passband of the blanker and thus tend to turn it off a bit, but even this is preferable to a band full of noise.

I received one report that an operator had experienced a loss of audio intelligibility after modifying. There has been no sign of this here! The operator had not included the 82 ohm resistor part of the modification because he could not see where 82 ohms, in series with 10k ohms, could make any difference. With this I had to agree, but I did put the resistor in and mine is okay. I am endeavouring to find out from overseas whether the 82 ohm resistor is a separate item or should be 82.0, 8.2k or even 820, or as someone else suggested, are there other circuits around which we do not know about, where R86 could have an effect with 82 ohms in series.

Whatever the situation, I think I can safely say, those wanting to proceed can do so as I am very satisfied with the operation of my IC-551 under noisy conditions. The only noise the blanker will not remove is low level (S-2-3) noise of a different

type from the usual power leak, but at that level it does not worry me too much, and I have yet to find the blunker which will remove it, anyway!

OVERSEAS

CQ ham radio from Japan later Graham VK6RO, lists two AM stations on 50.810 MHz — BY-RADIO and UA-RADIO. It seems they must be vying for the position and perhaps even sitting in top of one another.

The November 1986 issue shows very little amateur activity through September, apart from stations in Korea and Hong Kong. VK6RTT, the beacon on 52.320 MHz was heard at 1725 on 12/9 and VK6YA on 52.050 at 1728, both reported by 8M0ZS who could be a SWL. On 14/9, VK6ZKG/M4 was noted by JF2JWW at 1700. Also, on 12/9, VK4FXZ and VK4FFX were listed. The Malaysian television is heard regularly on 48.250 MHz and occasionally TVQ9 on 51.750.

It was also interesting to note in the same publication the details of an antenna gain check on 50 MHz antennas. The highest gain at 14.42 dB (9.70 dB F/B) was obtained by a JF3GPs design on a 12.98 metre boom and having eight elements! Next was a 12 element Yagi on a boom 13.07 metres long with a gain of 14.19 dB (20.50 dB F/B) and of NBS design. All of the eight and nine element designs submitted scored very well in the forward gain area. One six-element on a 9.58 metre boom gave a gain of 12.48 dB (13.40 dB F/B) so there are some good antennas around. Maybe my pair of eights aren't too bad after all!

LATE NEWS

As these notes are being written, it is hard not to keep an ear on the VHF bands and 22/12 was certainly a day of rewards. Before 0000, VK6RAS on 52.485 was S9+, but the Alice Springs boys were obviously still in bed! First good signal was VK2YVU at 0008 S9. Glen said he was using his 28 MHz beam! Then had quite a chat to John VK2BHO, and then VK4s started to appear. 0119 for a contact with Eddie VK1VP, then a brief exchange with VK2RS3. Another chat with VK4AAU at 0137. At 0449, had a contact with Henri FK8EB, who was 5x6. He was clobbered by VK2 and 3 stations, but I still got him! Then more VK1 and 2s. Next the ZK2SIX beacon on 52.100 was noted about 0430 at S6. I tried calling ZK2, but to no avail. Then Bill VK5ZVP kindly informed me ZK2RD was on 52.049. I gave Robert a call which he returned and we worked at 5x7 for a short time. I was in the country for the other being 302ER. So it was well worth getting away from the typewriter for awhile!

Other news picked up on the band whilst sculling about — not necessarily in time order: ZL2TPY worked more than 30 VK stations on two metres during the evening of 21/12, ZL working regularly into VK4, mainly from the North Island, but two metres not getting as far as Christchurch. Steve VK4ZSH, working VK3 and then VK1 on two metres, then VK2RSY, the two metre beacon became S9+, then lengthened to VK7. All this started at 2200 and was still going at 0100. ZL1 and ZL2 had five hours of two metres to VK on 21/12, from 0310 to 0815. At 0036, VK2YDC worked 29BH on six metres.

VK1VP worked ZK2RD at 0603 on 21/12, while others also in VK2 and VK3 worked him. Also on 21/12 P29ZES was worked in Rockhampton. Same day VK5RO was rewarded by working VK8ZCU at Tennant Creek on two metres at 0400 while I had a cup of tea! Later told VK5ZDR worked him too, for the second year in a row. In a period of three hours on 21/12, VK1VP, VK1BUC and VK1BGG worked over 20 VK2s and VK4s on two metres.

Going further back, on 5/12, VK4ALM worked VK0SJ at 5x5 at 0850 and did the same thing again two days later. VK0SJ was also worked in Townsville. On 14/12, VK8ZLX worked to Rockhampton on two metres. Should be a lot of this to report to you next month.

Double hour Es on two metres is not very common, but VK6ACM worked into VK2 on 22/12. ZL1BHX to VK8ZLX would also be double hour — I wonder if they made it? Have to stop now!

MACQUARIE ISLAND VHF OPERATION from Gil VK3AUI

During 1986, Sojo VK0SJ, operated from



Sojo VK0SJ.

Macquarie Island. Sojo had equipment for six and two metres, with a keyer to alert anyone hearing the signals.

Around 100 watts of RF was available on both two and six. The aereals were mounted on a tower, atop a hill — four elements on six and 14 elements for two metres.

Sojo took his own two metre equipment and various other items of equipment were loaned for the operation.

Operating from this harsh environment, Sojo was able to give many VHF operators a contact with Macquarie Island — including the first contacts with the island on two metres made by Sporadic E propagation.

Macquarie had been activated previously on six metres, however, this was the first two metre operation.

The equipment is returning to Australia after a successful operation, but the aereals will remain to be used by anyone in the future. (Six metre operation will continue as one of the current years personnel has taken a rig to the island). Many thanks to those who assisted at various times.

It is hoped that VHF operation will continue in the future. There are still a number of places to be worked on six. Two metres holds great promise, with a large number of possible contacts and propagation modes.

On UHF, a very interesting and rewarding operation would be possible. Tropospheric and Auroral propagation would be very interesting.

With the improvement of communication to Antarctic Bases, the possibility of quickly alerting operators to communication opportunities exists.

Many thanks are due to the operators from Macquarie Island over the last four years. They were VK0s AP, CK, YL and SJ.

Also, thanks to those who assisted with material and support. They included VK3s GJ, IO, JH, NM, XQ, AUL, AUQ, BDL, YTB and Werner Wulf.

Werner provided the six metre beam which has withstood the harsh environment so well — four years is a long time under those weather conditions.

Hopefully, operations will continue at Macquarie Island. Other bases are not without VHF and UHF possibilities. Who will make the first six, two and 432 MHz QSOs from Heard Island and the Antarctic continent? Now! There is a challenge if you are headed for the Antarctic.

CLOSURE

Closing with two thoughts for the month: The measure of life is not its duration, but its donation — and — Smart is when you believe only half of what you hear. Brilliant is when you know which half to believe. 73 The Voice in the Hills.



Sojo's Macquarie Antenna.

MISSING PERSON

The NZART have forwarded correspondence they have received from the Salvation Army, who is trying to locate **Andrew Vincent Kearney**. Andrew was born in Melbourne on December 22, 1963.

Andrew once held the amateur call sign, VK3YTM, however this has not been renewed since his disappearance.

Should anyone know the whereabouts of Andrew Kearney would they please contact the Salvation Army Headquarters in their State and/or the Federal Office of the WIA at PO Box 300, Caulfield South, Vic. 3162.



Sojo's Equipment.



Electro-Magnetic Compatibility Report

FROM HEAR & THERE

Hans Ruckert VK2AOU

EMC REPORTER

25 Berrillie Road, Beverly Hills, NSW, 2209

Earlier reports showed what had been done in West Germany with regard to EMC. The following cuttings from QST indicate that we still have a long and frustrating way to go, before EMC is understood by all authorities and by the public in the necessary logical and technical manner. The lonely radio amateur is so far in a hopeless position in most countries.

JACK RAVENSCROFT VE3SR: QRT
HR Bulletin 13 from CRRL, London, Ontario, 1986 April 09, to all radio amateurs BT.

Today, in what Canadian amateurs will likely regard as a flagrant miscarriage of justice, the judge hearing the case of Houghtby vs Ravenscroft, in which Timothy and Dale Houghtby of Kanata, Ontario, sued their neighbour, Jack Ravenscroft VE3SR, for damages arising from alleged interference to their furnace controls, microwave oven and home entertainment equipment, decided the case in favour of the Houghtbys and against Jack Ravenscroft. The judge granted a permanent injunction prohibiting Jack from transmitting radio signals, from his home or from his land, that would result in disruption of the operation of electrical or electronic equipment in the Houghtbys' home. The judge also ordered Jack to pay \$2558.60 in damages, all of the Houghtbys' legal costs, plus interest on monies the Houghtbys laid out during the course of the case. The unexpected outcome of this case is a severe blow to the Canadian Amateur Radio community and a potential threat to the operators of any licensed transmitter, even a transmitter in broadcast or other commercial service. Jack will decide whether or not to appeal the case in the next few days. His decision, in part, will be based on whether or not the Canadian Amateur Radio community appears willing to provide financial support. Even if Jack does not appeal, there is still a need for money. Jack's own legal costs plus what he has been ordered to pay will add up to about \$40,000. To date, the Canadian Amateur Radio community has donated some \$18,000. In fighting for all of us in this precedent-setting case, Jack could be \$22,000 out of pocket. We hope this makes you feel like writing a sizable cheque. Please send it to the JRSF Fund, Box 8873, Ottawa, Ontario, K1G 3J2, AR.

Jack was convicted of being a nuisance. In his *Reasons for Judgment*, Judge Hollinger of the District Court of Ontario stated: "The (DOC) tests indicate that several devices in the Plaintiff's residence are affected by the operation of the Defendant's radio station." He added: "The tests did not involve any determination of the extent to which modifications of the Plaintiff's electrical devices would reduce or eliminate the interference," he concluded. "On the evidence before me, it would be difficult and probably impossible to completely suppress the Plaintiff's equipment (sic) from interference caused by the Defendant's radio station."

Judge Hollinger was not moved by a defence argument, put forth by Communications Minister Masse in the letter that appeared in last month's *Canadian News Fronts* column. The Minister stated that the malfunction of various devices was "...not the result of improper operation of the amateur radio station, but rather the inability of these devices to adequately reject the amateur's transmissions." Instead, Judge Hollinger took the Minister to task for not doing his duty. He quoted Section 64 of the General Radio Regulations Part II: "Where interference to the reception of radiocommunications is caused by the operation of an amateur station, the Minister may require that such steps be taken as are necessary for the prevention of the interference, and the operator of the station shall comply immediately with any such requirement." He added: "In the case before me, the Minister took no such action. In fact the

Plaintiffs got relief only by way of an interlocutory injunction granted after an action was commenced." Now, that injunction is permanent.

You can only take so much. Jack and his family have been "through the mill" on this case for two years. No one will blame Jack if he decides not to appeal. Of course, we all hope he will, for his sake and ours. As mentioned in the CRRL bulletin, a major factor in Jack's thinking will be whether he feels he has the backing of the amateur radio community. We feel that he has.

Only hours after Judge Hollinger's decision was announced, CRRL was flooded with calls from amateurs asking for details and how could they help. One of the most unexpected and perhaps the most meaningful was from a group in Cincinnati, Ohio. Their concern was a poignant reminder that amateur radio is still a fraternity, and when the going gets tough, borders be damned and amateurs stick together. Then there was the Durham Amateur Radio Fleamarket. CRRL people, I'm proud to say, set up a special booth to collect \$500 for Jack. It quickly became a nonpartisan effort. At various times the booth was manned by a CARF Ontario Director, the CRRL President and representatives of RSO. In five hours they collected \$2300.

At press time, there were indications that commercial radio organisations and possibly even DOC were preparing to support Jack. However, these may not come through — and it is our battle. So, what about you? If you're like me, you're probably sitting in front of two or three thousand dollars' worth of pretty nice radio equipment. It's a sobering thought that we could be put off the air because we were creating a problem in someone's home and it was the same situation as Houghtby vs Ravenscroft and the precedent was set. Surely it's worth \$10 or \$100 or more to ensure that we can remain on the air. Let's get to writing those cheques. —Harry MacLean VE3GRO.

JACK RAVENSCROFT UPDATE

Jack Ravenscroft VE3SR, has decided to appeal the Ontario District Court decision that put him off the air and made him responsible for damages and costs arising from "interference" in a neighbour's home. The actual appeal was filed on May 6, 1986. Although no additional court appearances will be involved, the appeal will take many months and cost between \$10,000 and \$20,000. Most amateurs understand the danger of leaving the court decision unchallenged. Any one of us could be next. It is unfair to expect Jack, who has incurred financial obligations of about \$40,000 to date, to carry the burden for all of us. If you have not yet made a donation, please make one now. If you have made a donation, please consider making another one. Send your cheques to the JRSF Fund, Box 8873, Ottawa, ON K1G 3J2.

One reason for the unfortunate outcome in the Jack Ravenscroft case is that Canada has no RF susceptibility standards for consumer electronic equipment. Bill Loucks VE3AR, CRRL representative at a recent meeting of RABC's EMC Committee, reported little enthusiasm for such standards among most RABC members. Nevertheless, the work goes on. CRRL has endorsed an initiative by the executive of Ottawa Valley Mobile Radio Club, who contacted the Minister of Communications and the Minister of Consumer and Corporate Affairs, calling for standards to protect radio users and consumers of electronic equipment. In addition, CRRL people are now working on a document, similar to one prepared by ARRL for FCC, calling not only for standards but for labels on consumer equipment, warning of possible RF susceptibility.

ARRL has filed a petition for reconsideration concerning the dismissal of its petition by the FCC Chief Engineer to require the labelling of home electronic equipment relative to its susceptibility

to RFI. The Chief Engineer had stated in his dismissal that the Petition was premature as necessitating mandatory RF rejection standards. The League's Petition for Reconsideration disputes this, stating that the labelling is independent of RF-susceptibility standards, and it would encourage voluntary compliance by manufacturers without adding any additional work burden on the Commission. The labelling requirement would also serve to educate the consumer by suggesting that the consumer should contact the manufacturer for assistance in case of interference.

—The above is reprinted from QST, June 1986

RFI

The FCC's three-year-old inquiry into the problem of radio frequency interference, or RFI, is bearing in what could be a very dangerous direction for amateur radio and other long-time users of the radio spectrum.

For decades, the Commission's approach to resolving interference problems has been based on the sensible doctrine that interference should be eliminated by correcting the technical inadequacies in the equipment. If the transmitter is radiating harmonic energy that causes television interference (TVI), fix the transmitter; if the problem is inadequate selectivity or shielding in the TV receiver, fix the TV set. Under this doctrine, interference to stereo systems, smoke detectors and other devices not intended to detect RF radiation clearly is the responsibility of the manufacturer of that equipment, not of the transmitter operator who is unlikely enough to be nearby. When the roof leaks you don't blame the clouds, nor is the solution to legislate against rain.

Over the past several decades, thousands of grateful US amateurs have had their right to operate defended by the agency that granted their licenses: the Federal Communications Commission. Communications engineers have a fine record of coming to the aid of amateurs wrongly accused of being the source of their neighbours' problems. While the growth of CB-related interference has made it impossible for the FCC to provide the individual attention it once did, the Commission's staff has continued its efforts to educate the public as to the true nature of RFI and the shortcomings of consumer electronic devices. For example, more than 240,000 copies of the excellent FCC booklet, "How to Identify and Resolve Radio-TV Interference Problems," have been distributed since 1977. By contrast, the response of the industry responsible for the existence of the problem, the companies that reap millions of dollars in profits from the sale of RFI time "bombs" to unsuspecting consumers, has been to deny that a problem exists. Had the industry spent as much on engineers as it has on lawyers and lobbyists, that booklet would be much less in demand.

When it opened Docket 78-369 with a Notice of Inquiry in 1978 (see March 1979, QST), the FCC said it wanted to examine in detail every aspect of RFI. It posed a massive set of questions to which answers were sought, dealing with consumer issues, engineering issues, and the experience of other government agencies. Unfortunately, a whole category of potential questions somehow was overlooked: questions which might have sought information from the operators of Commission-licensed transmitters. Even so, the response was such that a lot of questions in two years for the Commission to analyse it and issue a Further Notice of Inquiry (see "Happenings" September 1981, QST).

The Further Notice is encouraging on several counts. It is clear that the Commission does not buy industry arguments that a problem does not exist, and that it recognises the danger in the increasing presence of microprocessors in every-

day line — microprocessors that not only may be susceptible to RFI, but may even generate enough RFI to cause interference. There is even some cause for optimism on the TVI front, according to the Commission, because the Electronic Industries Association (EIA) has published a bulletin which suggests procedures for testing the susceptibility of TV tuners to front-end overload and which contains a recommended level of performance. Unfortunately, the bulletin "... is not an EIA recommended standard and manufacturers are under no obligation to adopt its suggestions." Furthermore, it does not address the problem of interference that enters the TV set via a path other than the antenna terminals. Still, it is a start, and some television manufacturers are making a good attempt to comply with EIA bulletin despite the fact that their cut-rate competition is not obliged to follow suit. Of course, this does nothing to solve other RFI problems, such as audio rectification.

What is troubling about the Further Notice is that in outlining its policy options, the Commission appears all too willing to sacrifice the mandate of the Communications Act, that the FCC is to "... generally encourage the larger and more effective use of radio in the public interest...". On the altar of short-term economic expediency. Some of the options apparently under consideration (otherwise, why publish them?) would place burdens on the operators of radio transmitters that are simply indefensible on technical grounds, and the choice of options apparently is to be based on economic, not engineering, considerations.

The most offensive policy option would make operators of radio transmitters responsible for resolving interference problems, regardless of technical fault. The supporting rationale is that this would "... shift the responsibility for interference control from the government to the affected parties..." and would provide an "... incentive (to those transmitting interfering signals) to avoid interference." (Of course, where the transmitter is radiating spurious emissions that "incentive" already exists.) Elsewhere, the Commission's report provides an eloquent argument against this particular option:

The incentive of equipment manufacturers to redesign their equipment is weakened or eliminated if, as interference problems arise, the Commission moves to eliminate the interference in other ways, for example, by placing responsibility on the transmitter. ... Not only is the incentive to manufacturers reduced but such action may inhibit the fullest possible use of the spectrum.

The logic of this argument is unassailable, and if the Commission's deeds matched these words we would have little to worry about. However, in at least three recent cases the FCC has acted in violation of that logic. Paging services operating near 43 MHz are not being granted permanent authorizations to operate because of poorly shielded IF stages in home television receivers. Expansion of noncommercial FM service is being inhibited because of inadequate adjacent band selectivity in TV sets tuned to channel 6. Inland waterways operators adjacent to TV channel 13 will be fully responsible for TVI that results from the same cause.

It's time for the FCC to abandon this stop-gap, ill-advised approach that results in vast amounts of spectrum being held hostage to inadequate receiver design. It's time for the consumer-electronics manufacturers, who sell their equipment on the promise that it will give good performance to the purchaser, to accept responsibility if that performance is not delivered. If the responsibility is not assumed voluntarily, it's time it was made a condition of doing business in the electronic marketplace. —David Sumner K1ZZ

—The above is reprinted from QST, September 1981

MASSACHUSETTS STATEMENT GENERAL AGREES WITH LEAGUE ON RFI

Earlier this year the Town of Andover, Massachusetts, began revising its local zoning ordinances. One of the proposed provisions provided certain "operating requirements" for "amateur communication antennae." This section was as follows:

"3. The operation of any device authorized by the Board shall not cause interference to neighboring television and radio reception and, if such occurs anytime after installation, the applicant shall, in a timely manner and at his expense, correct the cause of the interference as determined by a qualified engineer/technician.

League Headquarters was made aware of this proposal by Ed Fletcher K1JRE, who attended hearings but tried in vain to reason with the members of the Andover Planning Board. Ed argued that amateurs in the community could not accept such conditions and that, in any event, the Board was pinning the blame for RFI on the wrong parties. Nevertheless, the Board passed the ordinance and submitted it to the Massachusetts Attorney General for approval.

Ed contacted Headquarters for help. It was fortunate that Massachusetts law requires that all new ordinances be approved by the State's Attorney General because this gave the League another opportunity to oppose the ordinance. The ordinance was not yet "water over the dam."

Chris Imlay N3AKD, of the ARRL General Counsel's staff, appealed to Assistance Attorney General Henry F. O'Connell, Jr. to inform the Town of Andover did not have the legal authority to regulate matters of radio frequency interference. "In addition," Imlay wrote, "it places upon amateurs a burden over which they have absolutely no control. The problem of radio frequency interference results not from any fault or effect of amateur radio transmitters, but from the inability of home entertainment electronic devices to reject unwanted signals."

O'Connell and the State Attorney General, Francis X. Bellotti, agreed. In a letter dated September 8 and addressed to Elden R. Salter, Town Clerk of Andover, the Assistant Attorney General stated:

"Paragraph 3(a) seeks to regulate amateur radio equipment and an interference resulting therefrom. The Federal Government has adopted a comprehensive scheme for the assignment of frequencies and the prevention of interference phenomena. (47 USC §4151 et seq.) (47 CFR 97.73, 97.131, 97.133). See *Schroeder v. The Municipal Court of the Los Cerritos Judicial District*, 73 Cal App 2d 841, 141 Cal Rptr 857 (1977), appeal denied 435 US 900 (1978). A local community may not legislate in this area."

Attached to the letter was a statement signed by Attorney General Bellotti declaring that the proposed insertion of paragraph 3(a) "is stricken and deleted therefrom."

VOLUNTARY TV/RFI STANDARDS

The Ad Hoc Committee on Public Law 97-259, sponsored by American National Standards Committee C-63, has produced its first voluntary standards for RFI immunity in TV sets and video recorders. These standards specify an immunity level guideline of one volt/meter to be used by manufacturers of TVs and VCRs. They are a tentative first step, and some committee members feel that it may not go far enough. Others worry that it will not be adopted by manufacturers. However, other participants think manufacturers have already begun to design the standards into the next wave of equipment. Among the participants in the Ad Hoc Committee were representatives of the Electronic Industries Association, the FCC and the Institute of Electrical and Electronic Engineers, and ARRL Atlantic Division Director Hugh Turnbull W3ABC.

—Above reprinted from QST, May 1986

MORE ON FCC PRE-EMPTION OF RFI

ARRL Counsel Chris Imlay N3AKD, wrote to the FCC for an opinion concerning a new ordinance enacted by the Township of Ewing, in Mercer County, New Jersey. The ordinance provides that it shall be unlawful for any person to transmit any radio signals that interfere with home electronic equipment in such a manner as to disturb the peace, enjoyment or general well-being of others. Imlay said in his letter that the question of interference is completely pre-empted by federal regulation and the Township's ordinance is invalid.

The Commission's reply, written by General Counsel Jack Smith, agreed completely with Imlay's assertions. The Commission stated that under the provisions of the Communications Act,

the Commission has the authority to establish minimum performance standards for home entertainment equipment. The Commission further noted that the rules in Part 97 "delineate the technical standards for operating amateur radio stations. State and local laws that either require amateurs to cease operation or pay fines when interference occurs conflict with our regulatory scheme. This is especially true when amateurs, who are fully complying with our rules, must cease operation or operate at technical levels below those established in our rules in order to avoid state or local sanctions." Copies of the Commission's letter are available from Headquarters upon receipt of an SASE. And what do the Township officials think of the FCC letter? Headquarters understands that the ordinance is in the process of being rescinded.

—Above reprinted from QST, June 1986

TV INTERFERENCE TRACKED DOWN

KADINA — For several months many Channel 10 viewers have been annoyed by reception problems, caused by a faulty antenna in the town.

Last week the source of the trouble was tracked down and rectified by a technician from O'Connell's Electronic Services, Jim Baker.

Jim, who is an amateur radio operator, has been suspected by neighbours of causing a nuisance and says he is tired of people knocking on his door at night hours of the day.

O'Connell's also had numerous complaints from people who thought the fault was in their own television sets.

The store allowed Jim time to track down the offending antenna. This he did by attenuating antennae input to a portable TV set in his van, and driving round Kadina streets and lanes in a diminishing circle to find where the interference was strongest.

After approximately two hours Jim located the trouble at a home in Ewing Street, where the TV antenna wasn't connected correctly to the booster. It took him only a matter of minutes to adjust the antenna, free, as a service by O'Connell's to the community.

—Reprinted from Amateur Radio

RFI & EMI STUDIES

I am a professional engineer and consulting scientist mainly working with the government and military in electronic design and systems engineering.

Some of my work involves RFI and EMI studies and the development of measures for the prevention of RFI and EMI.

Consumer electronic devices are designed as inexpensively as possible for the performance of their intended task without regard to RFI or EMI. For example, I have attempted to use my home computer in the dining room without success because of interference to my receiver. Naturally, the computer wasn't intended to operate alongside a communications receiver. A related situation came about when we were performing a series of acceptance tests on a military VHF receiver. A hand-held calculator caused so much hash that we could not use it inside our screen room.

As time goes by we will see more and more consumer electronic devices coming into existence in the home and business, all of which will create pollution of the airwaves. Currently, one can fly over any urban area and note the almost overpowering RFI pollution on a tunable HF or VHF receiver.

Keep up the good work, and press forward with the FCC for the establishment of stronger measures and responsibility regarding RFI and EMI enforcement and control. This should include every type of device. Special emphasis should be given to those that are powered from the 120-volt line, as they are usually the most serious offenders. —Dick Schellenbach NJ4F, Reading, Massachusetts.

WHAT THE MINISTER SAID

Frustration. It's press time and the outcome of the Jack Ravenscroft case is still not known. Jack VE3SR, is the Ottawa-area amateur who was sued by SASE for alleged interference with a neighbour's furnace control microwave oven and home-entertainment equipment. The following letter was presented as evidence at the trial. It was

written last summer, by the Minister of Communications, to the plaintiffs. At that time, the plaintiffs were applying pressure to have Jack's amateur radio licence suspended. We think the letter is instructive. It shows that DOC is willing to become involved in a case, even at the highest levels, and that DOC tries to be helpful and fair. Read on.

Under Section 4.1(1)(d) of the Radio Act, I do have the discretion to suspend or revoke a radio licence when the operator has wilfully failed to operate the station in accordance with the Radio Regulations or with the conditions of his licence.

The malfunction of various devices in your residence is not the result of the improper operation of the amateur radio station but rather the inability of these devices to adequately reject the amateur's transmissions. Manufacturers in Canada and abroad are aware of the need to design any item using solid state electronics to operate satisfactorily in the presence of radio waves, but often have chosen to modify affected units as a lower cost alternative to including the added protection in all units sold. It has been my staff's experience that problems, when they occur, can be resolved.

I understand that officials of my Department have assisted in the investigation of the problems with your furnace, electric organ and, to some extent, your microwave oven. Representatives of the manufacturers and retailers of these devices have been able to eliminate the interference to the electric organ. Unfortunately, tests with the microwave oven have proved inconclusive. I also understand that you wish no further tests, or modifications to your electrical devices, even though these are necessary to technically resolve the interference.

The regulations made under the Radio Act concerning interference are designed to provide protection to the reception of radio communications. All the electrical devices in your home investigated to date are not used for radiocommunications purposes, resulting in my Department's involvement being limited to that of a technical adviser to the manufacturers and their service agents.

As this matter is somewhat beyond my jurisdiction and with incomplete tests on the device involved, I am sure you can appreciate why I cannot revoke your neighbour's radio licence.

I realise that you have elected to seek legal solution before the courts. I encourage you, however, to participate in further tests as proposed by my Ontario Regional Director... as the best means to achieve a satisfactory solution.

Yours sincerely,
Marcel Masse

—The above is reprinted from QST, May 1986

The ARRL has petitioned the FCC to require the labelling of home equipment relative to its susceptibility to radio-frequency interference. The petition requests that the Commission require that a tag or notice be attached to home electronics devices or their instruction manuals to indicate whether the device incorporates shielding, filtering or circuitry designed to reduce its susceptibility to nearby radio transmitters. The tag or label also would warn the owner that the device may be subject to radio-frequency interference.

—The above is reprinted from QST, June 1986

The following letter was received from David Brownsey VK4AFA, in reference to the November EMC column. It is a true story of one of David's experiences.

It was a Saturday afternoon, and as a secretary of a large radio club I was attempting to answer one unattended correspondence. Progress was hindered by a steady stream of unwelcome door-knockers reminding me that the roof of my house needed renewing, my soul was in dire need of repentance, a donation to a school rifle was required and I needed some home product to make my home smell beautiful!

I settled down once again, however this was short-lived. I was then knocked on the door. At this stage of the afternoon I was about to inflict both verbal and bodily damage on the next caller. I dragged open the door and was met with the words: "You are causing interference on my television." He nodded his head towards my 10

metre quarter-wave vertical (homebrew) on the roof and the 80 metre long-wire attached to the toilet exhaust pipe. "You're an amateur, aren't you?" It was Fred (not his real name), a resident from one of the flats a few doors down the road.

I explained that I was not even transmitting, however Fred persisted that I was causing interference as I was an amateur.

By this time, after counting to 10 several times, I decided violence was not appropriate and a little public relations for amateur radio was needed. I inquired what symptoms Fred was experiencing — the picture was going up and down, and from left to right; intermittently disappearing then coming good. Also, there was sometimes a green band appearing across the screen. (I must remind readers that Fred was stone-cold sober).

I asked if he was receiving a picture that resembled looking through a Venetian blind, that was moving, and was there any distorted speech?

"Not Not at all," and Fred reiterated the symptoms as described previously.

From my experience of servicing televisions for nearly 20 years, and assisting fellow-amateurs with RFI and TVI problems for a shorter period, I was convinced Fred had television and aerial problems.

Diversions is a marvellous thing so I said that I had better go and check my television and see if I had similar problems. My television, a 28 cm portable, was rock-steady — a near perfect picture. I returned to the front door contemplating what to do next.

I told Fred that my television was okay and suggested that I come and have a look at his set taking my portable (an alignment tool, pliers, cutters and screwdriver were also included).

Both televisions were turned to the same channel and it was not long before Fred's picture began losing the vertical and horizontal hold adjustments. I commented that the vertical and horizontal holds required adjustment and offered to adjust them for him.

The back was already off the set and I was looking for the adjustments when Fred immediately pointed them out to me. (I was beginning to get the impression that Fred had been there, done that before!). A small adjustment on both pots made the picture rock-steady on all channels. I settled back waiting for the picture to disappear in the next breeze. I didn't have to wait long.

A visit to the lead-in wire was in order — it was 300 ohm ribbon attached to the outdoor antenna with a stand-off insulator halfway down the side of the house, complete with three very badly corroded and twisted dry joints under the house. I showed Fred these bad connections and explained that the whole lead-in needed to be replaced. However, in the meantime, I would replace these joints to give him service.

We retired to the television sets again, waiting for any further faults to occur (especially the one giving the green band across the picture) — the colour crystal was off frequency but did not show itself in my presence.

Fred's wife came to the rescue with many cups of black coffee and biscuits whilst both sets remained rock-steady.

We called it a day and a very sheepish Fred showed me to the front door — promising to let me know if the green band reappeared.

Oh yes — the correspondence was completed the next day after the door bell was disconnected!



QSP

DATAFLASH OPERATIONAL

AUSSAT is now transmitting Dataflash for the Department of Aviation. Dataflash is a satellite communication system especially set-up for the Department to design and develop. It is used for the transmission of flight plan and meteorological data, making many manual telegraphic systems redundant.

This year, the Department of Aviation has allowed a budget of \$8.97 million for rental payments to AUSSAT for the lease of four transponders.



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Australian Ladies Amateur Radio Association

Joy Collis VK2EBX
PUBLICITY OFFICER, ALARA
Box 22, Yeoval, NSW 2868

ALARA CONTEST

What a pleasure it was, in the 1986 ALARA Contest to catch up with some of our DX members and friends, many of whom we have had no contact with for a considerable time. One of the things that helped to make this contest even more enjoyable than the previous years.

Unfortunately, I was unable to be one of those well organised ladies (and there were some), who had their household chores done, meals pre-cooked, etc, and could devote their time to the contest without worrying about such mundane matters! However, as the OM was reasonably understanding, I was able to keep work to an absolute minimum and spend a fair amount of the 24-hours in the radio shack.

As always, the contest was well run, and friendly, and most comments received have been very favourable. Each year, more and more OMs join us, and we would like to thank all those who did so this year for their support and participation, which did so much to make our contest a success.

The only adverse comment I have received came from an OM who stated that he had listened and called on the CW end of the Voice bands at various times during the contest without receiving any response. While this was disappointing, I do feel that, largely as a result of coaching and encouragement from Mavis VK3KS, over several months, more YLs felt confident enough to attempt CW contacts than in previous years. We all owe Mavis a big vote of thanks for her efforts.

Our Contest Manager, Marlene VK2QFO, has received more logs than last year, coming from every Australian State, ZL, G, VE, W and FK8. This year, also, there is a winner for the Florence McKenzie Memorial Trophy. We hope to have the results in next month's AR.

OUTSTANDING SERVICE PLAQUES

Three ALARA ladies have recently been awarded a plaque for *Outstanding Service to ALARA*. They are Marlene VK3QO, Valda VK3DVT and Helene VK7HD. Congratulations to all of you on a well-deserved award.

GET-TOGETHER

An ALARA Get-Together is planned for 1987 — September 25-27. The venue will be Adelaide.

Our first Get-Together in September 1984 was very successful. We are sure our second will be just as enjoyable.

The following letter has been received from Ian Hunt VK5SQX.

"There has been some comment regarding the Federal Contest Manager's column in *Amateur Radio* magazine for June 1986.

"To ensure that the record is set straight, I wish to provide the following information.

"My column stated that — 'I am most supportive of those ladies who do so much to assist us mere OMs, particularly when it comes to such

things as social functions, providing food for us on field days, etc.'

"I stand by my comment regarding this aspect of matters. The ladies referred to do a great deal for us OMs. My wife has always encouraged me in my hobby. In fact, if it was not for her I would not have the top class amateur radio station that I do have nor the excellent shack accommodation with carpet and curtains in a completely separate building to our home.

"My wife always makes sure that I have enough food and drink to take with me on field days and provides me with a constant supply of same in the shack during other contests.

"Probably, nearly all our amateur radio social functions would be a complete flop if it was not for the support provided to such functions by the YLs and wives.

"In my column, I was writing about all the ladies, not just those who hold tickets. I do not just appreciate them, I support them in their efforts. My words were specifically chosen to indicate this.

"I also went on in my column in June *Amateur Radio* to comment on the matter of fitting amateur radio in with family life. This mention should surely indicate something. I believe that quite a lot of the OM operators should give this aspect of things a little more thought too. My feeling is that the YLs are usually far more sensitive to this matter. However, I digress somewhat.

"With regard to the YLs, you might note that there is around one and a quarter percent of YL operators amongst the WIA membership. On this basis the YLs are doing very well and certainly making their contribution.

"If there were an average of 10 members in each WIA Divisional Council (VK1-7) that would make 70 total. (There is not that many incidentally). Thus, one could expect, on a pro-rata basis, that there would be less than one YL involved overall. In fact, to my knowledge there are at least three currently as members of Divisional Councils, and only fairly recently, at least two others have been so involved. At Federal level, there is also Brenda VK3KT. There have been two YL Divisional presidents to date.

"I have also observed the fine work done by YL operators each year in connection with stations in the *Red Cross River Murray Gange Marathon* and this, under very trying conditions at times too.

"So, just keep on with your good work ladies. The record is already there to be seen and you do not really have to prove your worth or anything to anybody.

"I might claim, though, that this FCM (whose words were recently described in an amateur radio magazine as condescending claptrap) has done as much, if not more, than any previous FCM to provide publicity and encouragement for the ALARA Contest.

"This same person was also responsible, in some measure, for encouraging our much loved and appreciated Divisional President, Jennifer

VK5ANW, onto the VK5 Divisional Council. I have really enjoyed watching her develop her capabilities to become one of our best Divisional Presidents, ever.

"Incidentally, you might note that Joy VK2EBX, in her *ALARA Notes* in February 1986 *Amateur Radio* hinted at the sort of situation also alluded to me when she described what occurred after she emerged from the shack after the ALARA Contest as follows: 'I was greeted by the male members of the household with sighs of relief, and such remarks as "At last" and "What time's dinner?"

"Maybe a YL can make such comments and perhaps an OM should not do so! Even so, 'Vive la difference!'

Well, Ian. We certainly did not mean to upset you with any remarks of ours, and quoting further from the *ALARA* column in February 1986 AR:

"We were most appreciative of the many menfolk who joined us in making this fifth contest the best year, sparing no effort to give us valuable contacts, and those unsung heroes — the OMs (mine among them) who minded the children, cooked the meals, washed dishes, and made frequent cuppas so that we could participate to the fullest."

"We all appreciate and acknowledge the support and assistance we have received from the majority of OMs (not forgetting yourself, Ian).

Undoubtedly, things have changed a great deal from the early days when, in 1919, the VK5 Division decided (in consultation with other States) "This Institute at present is unable to admit lady members." (*The First Sixty Years — 1919 to 1980* by Marlene Austin VK5QO, October 1985 AR).

Now as you point out, the VK5 Divisional President is a woman — Jenny Warrington VK5ANW.

We are also most appreciative of the space given us in *Amateur Radio* each month, and the way in which our column is set out.

As you say, Ian — "Vive la difference."

ALARA AWARD

Certificates and Stickers issued since October 1986 are as follows. All endorsements for FK8FA are for 14 MHz SSB.

NO	DATE 1986	NAME & CALL	STICKERS
95	Oct 14	Robert A Park ZL2-259 (SWL)	1
121	Nov 20	Nev Cowgill VK2NEV	
122	Nov 21	Daryl Quirk L30444 (SWL)	2
123	Dec 10	Nathan Rosan W2-6893 (SWL)	
124	Dec 10	Aime Tuband FK8FA	3

Until next month, Joy VK2EBX.

Each year at their December meeting, the Publications Committee decides the prestigious awards for published articles in different categories that have appeared in *Amateur Radio* during the year.

Congratulations are extended to the following contributors.

TECHNICAL AWARD

Drew Diamond VK3KU, for his constructional articles — "A Four Watt CW Transmitter" and "A Direct Conversion Receiver."

The Committee recommended an honourable mention be made for Ken Kimberley's series on both the "A 10 MHz Frequency Reference" and "A Square Wave Generator."

AL SHAWSMITH JOURNALISTIC AWARD

"Field Days Can Be Fun" contributed by John Hampel VK5SJ.

PUBLICATION AWARDS

HIGGINBOTHAM AWARD

Jointly by Jim Linton VK3PC and Roger Harrison VK2ZTB, for their discussion paper "Amateur Radio — Future Direction."

Congratulations are extended to all the recipients and will your name be considered or appear as a winner this year? The project, experience or item of interest now, so it may be shared by the readers of the magazine and maybe catch the eye of the Committee for the 1987 AR Awards.



Awards

Ken Hall VK5AKH
FEDERAL AWARDS MANAGER
St George's Rectory, Albion, SA 5014

RL 50 JUBILEE AWARD

The RL 50 Jubilee Award is an official diploma issued by the *Reseau Luxembourgeois des Amateurs d'Ondes Courtes* (RL), a member society of the IARU. The award is to commemorate its 50th anniversary in 1987.

The award is available to licensed radio amateurs and shortwave listeners. It is issued to those who have contacted or heard Luxembourg amateur radio stations between January 1, 1987 and December 31, 1987.

Non-European stations must attain five points to be eligible for the award. A contact with an LX station counts as one point. A contact with LX0RL or LX50RL (authorisation pending) counts as five points. An LX station may be counted only once per band.

There are no restrictions in band or mode. Cost of the award is five IRCs, US\$2, 100 Lux F or DM 5.

An application accompanied by an extract of the log, certified by the Awards Manager, a club official or two licensed amateurs, should be sent to: *Reseau Luxembourgeois des Amateurs d'Ondes Courtes, Awards Manager, PO Box 1352, L-1013 Luxembourg, Luxembourg before July 31, 1988.*

THE LUXEMBOURG AWARD

The LX Award has been issued since 1970 by the *Reseau Luxembourgeois des Amateurs d'Ondes Courtes*, (RL), in commemoration of 50 years of radio amateur activity in the Grand-Duchy of Luxembourg.

The Award is available to licensed amateurs and shortwave listeners.

All LX contacts made by radio amateurs since January 1, 1951 count for the LX Award.

The Award is issued in two sections:
The HF Award: Applicants must provide proof of having obtained the following number of points — Non-European stations 20 points. Each contact on 14, 18, 21, 24 and 28 MHz counts as one point. Each contact on 1.8, 3.5, 7 and 10 MHz counts as two points. If the same station has been worked on all HF bands, non-European stations may count 15 points.

The VHF Award (30 MHz and above): Applicants must provide proof of having obtained a total of 30 points. Contacts on 144 MHz count as three points. Contacts on 432 MHz and above count five points. Contacts via earthbound repeaters are not valid.

The same station may be worked once on each band in different modes. There are no restrictions on mode.

Applicants should submit a list showing the date, station worked or heard, time, band and mode, duly certified by two licensed radio amateurs or by the Awards Manager of their society.

Applicants to be sent to: *Reseau Luxembourgeois des Amateurs d'Ondes Courtes, The Awards Manager, PO Box 1352, L-1013 Luxembourg.*

Fee for the award is 10 IRCs, US\$4 or 200 Lux F. Any dispute concerning the LX Award shall be settled definitely by the Board of the RL.

EUROPEAN COMMUNITY AWARD

The European Community Award is an official diploma by the *Reseau Luxembourgeois des Amateurs d'Ondes Courtes*, in order to commemorate the 25th anniversary of the European Community, and is available to all licensed amateurs and shortwave listeners.

Each contact made with a station from one of the member countries of the European Community, made on or after the day of the country's entry into the European Community, count as one point.

— each station may be counted only once.
 — no more than 20 percent of the points may be obtained by contacts with one and the same member country.

— a contact with the special station LX0RL may replace a missing contact with any of the member countries.

— contacts made via active earthbound reflectors or repeaters may not be counted.

— there are no band or mode restrictions.
 — non-European stations must amass 50 points; each member country must be worked at least once; three LX stations must also be worked.

Applicants shall submit a GCR-list confirmed by two licensed amateurs, or by one club official or by a notary. However, in case of doubt, the diploma manager may ask the applicant to submit QSL cards for checking purposes.

Application fee is 150 Lux F, 10 IRCs, US\$4 or 7 DM.

Applications to be sent to the Diploma Manager, PO Box 1352, L-1013 Luxembourg.

The following list gives the names of member countries of the European Community and the date of their entry.

March 25, 1957
 DL Federal Republic of Germany; Italy (including IS and IT); ON Belgium; F France (including FC); LX Luxembourg and PA Netherlands.
 January 1, 1973
 EI Ireland; QZ Denmark and G United Kingdom (including GD, GJ, GM, GU and GW).
 January 1, 1981
 SV Greece.
 January 1, 1986
 EA Spain and CT Portugal.

RECENT JUBILEE 150 CERTIFICATES AWARDED as at December 26, 1986

873 VK1KRD	874 SMODEN
875 4Z4VG	876 7FIE1
877 VK2EDQ	878 JZTBO
879 VK4FLH	880 QAOEDA
881 YCOPPM	882 YB8VHS
883 YB8VM	884 YC3BKX/8
885 YC7DF	886 YB7ZXX
887 YB7BC	888 YC7ZAF
889 YC7DX	890 YC7ZAF
891 YC7BS	892 YC7ZAF
893 YB3CEV	894 VK5NMA
896 JRIKQW	897 JK3DQX
899 JAWVVK	899 JMS4DQ
900 YC3BOB	901 K8IRY
902 W3WYP/DU2	903 ZL2BCX
904 N6DCO	905 JRIAD
906 JG7BFJ	907 JATBSD
908 JG7BFJ	908 YC8TR
910 YC8SP	911 VK5V
912 YB3CDL	913 VK4AOH
914 G3KLL	915 A Thompson SWL

916 VB5HG	917 WAGNMG
918 DG7KG	918 J3PVU
919 ZK2MAP	922 VK2FGW
927 VK6AKU4	928 VK5BA
936 VK5KGS	939 G4WQW
940 V85R	941 SMAJEV
942 K4SVZP	943 SM7NFM
944 G4VIO	947 VK3AUM
948 VK5NOT	951 G3AB1
952 YO4JQ3	953 VK2NEV
954 VK6DY	956 AP2DM
957 LA1JDA	958 DUBRG
959 4X4DX	960 W6H8F
961 K6GPMU	962 G4WZF
963 G8BZM	964 SML8L
965 VK3DCR	966 VK2VZB
967 JAS3CQ/2	968 ZL2AA1
969 JATM4	970 VK6APM
970 ZL3AD2	972 ON6HRT
973 DV2EG	974 JA3UCO
975 LA2ZN	976 YB5QZ
977 JAS10Q	978 JAZ2EQ/2
979 YC7NI	980 9N1MC
980 LA6DLU	987 ONL4003
988 YB3DX	989 G3ZBA
990 OE1PPC*	991 HB8AIB*
992 DF7UB	993 ZL4LD
994 9M2GH	995 G0CAK
996 IK3FHP	997 G0AWF

998 KS2F	999 I2ECOW
1001 G3CPT	1002 NG0XA
1003 KARESO/VE8	1004 4X6RA
1009 VK2DYS	1011 YC05Y
1012 YD0NI	1013 G4YJH
1014 FK02SAT	1015 VK7KMR
1016 VK3CCB	1017 VK5NWM
1018 VK8NPH	1019 VK4BAJ
1020 VK2PQI	1022 VK2PWS
1023 VK5AII*	1026 VK4BMP
1028 VK5NAV	1029 VK4NMA
1030 VK2SJ	1040 VK2MT
1044 VK5AGX	1045 VK8NBM
1046 GM4VMV	1047 G4MXLU
1048 VK5ADO	1049 VK5NBM
1052 VK2PUP	1055 P McMillan SWL
1056 4Z4UK	1057 YC9VDT
1058 VU2VVC11	1059 JH8QAI
1060 JASJN	1061 JG2VIV
1062 J1K1T	1063 JABCE
1064 PA0XPQ12	1066 KAC2C13
1066 GM4LDU	1067 G4Z2K
1068 VK3PHE	1069 VK3PUA
1070 JAGEBV	1071 JRFYS
1072 JH5CKV	1073 JESLS
1074 JN3HFR	1075 JH2UZR
1076 JRICTA	1077 N6CGB
1078 VK4V5I	1079 VK3PMO
1080 VK2CWG	1081 YB1QH4
1082 YB6TG14	1083 ZL3JU
1084 ZL3QO	1085 ZL2ANT
1086 ZL1AMR	

1 First France	9 First Sweden
2 First Peru	10 First CW GRP
3 First Philippines	11 First India
4 First Six metre band	12 First Holland
5 First Rumania	13 First US Forces in Japan
6 First Italy	14 First China
7 First Belgium	15 First DDR
8 First Austria	

WIA 150 AWARD

Applications for this award will not be accepted after March 31, 1987. Claims continue to trickle in, but the time has come for this highly successful award to be closed.

FURTHER WIA 75 AWARD RECIPIENTS

682 H Loegman YC3FNL
 683 Sergi Amburger VK1NAS
 684 Sjoher H Daud YC7CR
 685 Sonny Soemmarsono YB3WC
 686 MH Faried YC3ENT
 687 T Nusrat Kusuma YC0KRC
 688 Hildgard Dioloseputro YC3CA
 689 Hendro Santoso YC3GCE
 690 Slamet Falsal YC3MRX
 691 Awik Asnawi YC3CCM
 692 Arman Mallolangan YC8CDK
 693 I Ketut Yadnya (Jim) YG9BEL
 694 Leopold Dunajewski SPB3ZY

— Contributed by Jim Linn VK3FC, WIA 75 Award Manager & Maxine Conrady

AMATEUR TELEVISION AWARD OF QUEENSLAND

This award is presented by the South East Queensland Amateur Television Group Inc, for sustained excellence at ATV. The award is available on reception of a completed log showing ATV activity on the 70 cm band and above, according to the rules. Assistance with tube postage is requested and \$1, or equivalent, shall accompany the submitted log sheet.

The award shall be available for points accrued on, or after, January 1, 1987. No recognition of activity prior to this date for the purposes of this award shall be given.

Separate awards shall be available for the transmission and reception of ATV signals.

Points Score: Repeater contacts — one point (maximum of 50 points). Simplex contacts — a) up to 30 km: five points; b) over 30 km: 10 points; c) portable: 20 points. Minimum award points — 200.

RULES

1 Only one contact with a given station each day may count towards the score. However the same

station may be worked on that day using a different ATV frequency.
 2 Points may be claimed for the positive identification of any ATV transmission.
 3 The award operates on the "honour system" and no QSL cards, etc, are required. The log sheet requires that transmissions be acknowledged by the receiving station.
 4 The awards shall be administered by the Awards Manager, who shall seek the support of the management committee in the event of a dispute.

All applications for this award shall be addressed to: The Awards Manager, SEQATV Group, PO Box 3, Chermide, Old, 4032.
 —Contributed by Tom Ivins VK4ABA, Secretary, SEQATV Group Inc

GB2SDD CALLING THE WORLD

The Saint David's Day Special Event Station will again be operational on March 1, 1987, to celebrate the National Day of Wales.

The Special Event Station will be operational from midnight Saturday, February 28, to midnight, Sunday, March 1, 1987. Activity conditions permitting, will be on all HF and VHF amateur bands.

A team of enthusiastic operators will be pleased to make contact with all-comers and, as always, will endeavour to send greetings to as many countries as possible world-wide. All are cordially invited to join the celebrations!

The Special Event QSL Card will be sent to all amateurs making contact with the Saint David's Day Station and replies will be sent to SWLs. IRCs would be appreciated if cards are required by return post.

All licensed amateur operators interested in the attractive Saint David's Day Award should aim to meet the following requirements:

Contact should be made with the Special Event Station on Saint David's Day, March 1, 1987, and five other Welsh amateur station during the months of March, April and May 1987.

To claim the award, forward copies of your logged contacts together with 10 IRCs, to cover postage and packing, to: Event Co-Ordinator Mr R R Jones GW4HOQ, "Bryn-Ynys", 13 Strawberry Place, Morriston, Swansea, West Glam. SA6 7AG.



Pounding Brass

Gilbert Griffith VK3CGG
 7 Church Street, Bright, Vic. 3741

Welcome to Pounding Brass 1987. DE VK3CGG, name Gil, QTH Bright in NE Victoria (near Porepunkah).

I hope you will welcome me, and that my efforts bring you as much pleasure as my reading of this column have in the past. I will have to try to keep up to Marshall's standards, so let's hope that my being such a newcomer to the ranks of Amateur Radio will allow me to pass on a few of my learning experiences while they are still fresh in my mind.

Needless to say, I was very surprised when Bill Rice rang me with the news that Marshall was retiring and would I take over the Pounding Brass column. It really is a great honour to be selected and I hope I can live up to it.

So, where do I start?
 I have been licensed for two years now, and about 90 percent of my operating is CW. VHF and UHF are not too successful here surrounded with the mountains, so about 10 percent of my time is on the local repeaters.

I will take the opportunity, as this is my first column, to thank a very few of the people who helped me get started as a Knight of the Key. Ron VK2DOR (VK2BWI), for his slow Morse, was the SCLLact/allfirst copied by me on September 6, 1984. Thanks to the VK2 and VK5 WIA Slow Morse Broadcasts, as I was able to pass both examinations in the November 1984 sitting. Then came the hard part — getting on air. For their example, patience and advice, I will thank Clive VK3QDL, Merv VK3GZ, Bill VK7NRV, Dennis VK2CET, Vic VK5AGX and a number of other operators who slowed down and gave me encouragement through my mistakes when the key seemed to have a mind of its own. Thanks Ian VK5QJ, the Federal Contest Manager, who has, through his column and personal letters, interested me in contesting.

Contesting is really the way to learn fast. Even though, while sitting for hours in a "test I often say to myself that it is a lot of hard work and not much fun, especially when things are a little quiet. I think I get the enjoyment from meeting new people, sharpening up my ears, and (hopefully) increasing my skills. Most of the effort goes into the shack well before a contest in making sure that the station is in order. I have heard of stations suffering serious breakdowns during a contest, the prospect is so frightening I really hope I never happens to you.

Thanks to the hundreds of operators I have worked over the last two years. Especially those on the Friday night CW Net, Phil VK3CDO, Bill ZL4CY, David VK3DWW, Bob VK3AOX, Michael VK3AWX, Les VK3BPW, John VK3CAL, Mario VK3NI, Maurice VK3CWB, and others. Netting is not a great favourite of mine as I prefer a long rag-chew, but there are friends to keep up with and skills to be learned, including plenty of gossip and receiving practice on a net. You must learn to keep on the controllers exact frequency, and to operate the RIT effectively so that you don't miss the callers who are off frequency a little. One day, I will attempt controlling a net, a fairly difficult job to do properly, I would think!

Please feel free to write to me with your ideas, experiences, questions and answers. I think I will need all the help I can get. I will certainly answer all letters.

Back to business — I have been doing a lot of reading and going through plenty of old magazines for material, and, just to prove that no matter how enthusiastic one is, you will find that someone has probably said or done it before.

The following is from QST, August 1933, by N I Hall W8TI. It won the article contest prize for the month, too.

Gaining Code Speed

Who wants to increase his code speed? The answer is unanimous. All of us! The only reason we don't is that we hate to practice. But suppose we can increase it without practice. Sounds fine but how do we do it? Suppose that your operating speed is 10 WPM and that all of the other amateurs send 15 WPM or above. If you were even half an amateur, it wouldn't be long until you were doing 15 WPM with the rest of them. If you will grant me that, I'll prove to you that gaining code speed is fun and not a drudgery.

We are all looking for something to take the monotony out of the ordinary QSO. What could be better than improving both our sending and receiving speeds. Get your fist warmed up by calling and chewing the rag with operators faster than yourself. The next time you tune over the dial for a CQ to answer, wait until you hear one who is right up to the limit of your receiving ability or even a little above. Go back to him at just as near as his speed as you can send and still send code that sounds like English. Too many amateurs use the slogan that "Good 'slow' code is better than poor 'fast' code" when their slogan should be "Good 'fast' code is better than good 'slow' code."

If you are one of the fellows who can't send as fast as you can receive, buy yourself a good secondhand bug. It is a small price to pay compared to the satisfaction you will get out of it. Or for those who are mechanically minded, make your own bug. It is really easy. I made one myself, which proves it, his. Receiving is every bit as easy as sending. Just make it a rule to talk to the operators who send fast enough to give you some real practice.

When you get a good operator, instead of giving a report on his signals and saying 73, get him chewing the rag about gaining code speed, his sending, how he holds the key, etc.

Let the other fellow tell you to slow down if you are sending too fast for him or for the receiving conditions. Remember the Q signal for send slower is QRS, not QRM or QRN. No one was ever called a lid because he sent too fast, if he sent good code.

That is it for this month, it is lunchtime right now on Christmas Eve so I had better see if I can get this to the post office before the deadline.

A belated Merry Christmas and a Happy New Year to all!

W6EY & W2CA — SKs

Honorary ARRL Vice-President, J.L. (Mac) McCargar W6EY, passed away on October 26, 1986 at the age of 90. Mac was the Pacific Division Director from 1938-1946 and ARRL Vice-President from 1946-1950.

Harold P. Westernman W2CA, passed away late last year. He was an early employee of the ARRL, joining in 1926 to conduct the Technical Information Service, and from 1928-9 was Assistant Technical Editor.

—From The ARRL Letter, November 11, 1986

DXAC TURNS THUMBS DOWN ON ARUBA

DX Advisory Committee Chairman, WAFRU, advises the the Committee's vote on separate DXCC country status for Aruba (P4) was a tie. According to DXAC rules, this defeats the motion. Thus, Aruba will continue to count for the Netherlands Antilles listing which includes Curaçao and Bonaire.

—From The ARRL Letter, November 11, 1986

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Contests

lan Hunt VK5QX
FEDERAL CONTEST MANAGER
Box 1234, GPO, Adelaide, SA, 5001

CONTEST CALENDAR

FEBRUARY	
1-8	YL SSB CW Contest (concludes) 7-8 RSGB 7 MHz Phone Contest (Rules this issue)
7-8	OCWA CW QSO Party Dutch "PACC" Contest
14-15	YLRL YL-OM Phone Contest
14-16	CQ WW 160 metre SSB Contest
20-22	ARRL DX CW Contest
28	RSGB 7 MHz CW Contest (commences) (Rules this issue)
28	French Phone Contest (commences) (Rules this issue)
28	YLRL YL-OM CW Contest (commences)
MARCH	
1	RSGB 7 MHz CW Contest (concludes)
1	French Phone Contest (concludes)
2	YLRL YL-OM CW Contest (concludes)
7-8	ARRL DX Phone Contest
7-8	OCWA Phone QSO Party
14-15	John Moyle Memorial Field Day Contest (Rules this issue)
21-22	YL SSB Phone Party (Rules this issue)
21-23	BARTO Spring RTTY Contest
28-29	CQ WW WPX SSB Contest

ARRL DX CONTESTS

I have not received a copy of the rules for these contests. It is unlikely though that rules will have been changed from last year. You can check last year's rules by referring to those which I published in the January 1986 issue of *Amateur Radio*.

Rules for other contests mentioned in the calendar are also not to hand as I am preparing these notes quite early. I would hope that early submission of my notes may be of help while some difficulty could perhaps be experienced without Ken VK3AH, immediately at hand to see to the production of the magazine. I have only just heard of his accident and trust that by the time you are reading this Ken will be back and pretty well mended. We do appreciate all the work you put into the production of the magazine well looked upon by people all over the world. Ken, I often receive comments from overseas stations whilst running my many regular scheds, particularly to the USA and they are always complimentary of *Amateur Radio*.

Should you need more details of rules for contests, it often pays to go back through back issues of the magazine, as most of the major overseas contests are fairly well established and their rules change very little from year to year. There seems to be a general reluctance on the part of many of the overseas contest organisers to send out, in advance, the details of their contests. The lead-time for publication is probably enough of a problem for them to overcome for their own publication purposes without them worrying about other magazines. It could also be that, when the contests are run by "commercial" amateur radio magazines, they do not wish to provide too much copy for others. Naturally, such magazines are really in competition with the various magazines published by the national amateur radio societies in the various countries.

I realise that it is only human nature that, if you can find what you want on one magazine you will not run out to buy the same thing again in another magazine.

These are just a few points you may care to bear in mind.

By now we are well into the New Year and I hope that I will have caught up on the preparation and distribution of all certificates for both 1985 and 1986, once again. The former have been made out for quite some time, however, for certain reasons they have all been delayed in being mailed out. So, if you are due for a certificate for any of the contests — do not give up hope! All is being attended to, albeit somewhat slowly.

In the December issue, I stated that I still had some further comments provided by entrants in

the 1986 Remembrance Day Contest to publish. I now provide these additional comments for your interest.

Was pleased to get a cross-mode contact with you in snappy time. We did a little more during the year, being on two bands at the same time where compatibility allowed, as Mavis could use the Ten-Tec while I used the old Collins (now 22 years old and with the band-switch wafers replaced). However, we took our full sleep time, —VK3XB

Some of my contacts have RST reports as well as serial numbers. If the rules are to be taken to the letter, then all contacts that would be acceptable as valid QSOs for awards: is has a report, would be not allowed for the Contest. Operates for this contest took place from Wemba in Central Victoria. Power source there is a Honda generator, which refused to start for about two hours and so it was dark before I even got an antenna up. —VK3AUG

Bands were pretty lousy here. —VK3AL Sorry about my poor effort, reason is that my OTH is in a deep valley with hills 200-300 feet all round and within half-a-mile of my shack. Most of my contacts had to be arranged through our local repeater (VK3RBA). —VK3XEX a) Number of rough notes, one typical of early 1920s. b) An even greater number of stuttering electronic or bug keys operated by persons with glass arms. c) Several bouncing keying relays noted. d) No chirpy signals. e) Electronic keys with dots too fast and too light. f) One or two speed merchants over did it and fouled it. g) OTH on 14 MHz deep and rapid. h) Nothing on 21 MHz or 28 MHz. —VK4KW

As usual a lot of fun this contest. Also, we had good conditions. H — no thunderstorm this year. —VK4OD I have been on amateur radio since May 1984 and this is the third occasion I have submitted a log — always for CW operation only. —VK3DW Just two small logs this year in what was again an enjoyable contest. —VK3ZTR

A enjoyable contest with 13 watts to a dipole and only working stations calling CQ. Surprised at the lack of Novice call signs, but I guess many have upgraded. —VK3BR

I enjoyed the contest more this year having met the same call signs again in the RD. Although only a call sign — a familiar one is a friendly one. —VK3A As a former member of the Royal Armoured Corps, 5th Reconnaissance Regiment 1942-47 and have always had a leaning to radio and now have the time to enjoy it. I enjoyed the contest the second time since becoming licensed. —VK3NB

160 — hearing some, worked none. 80 — band very crowded on the Saturday night. 40 — band crowded at times, depending on time of day or night. 20 — few stations, but poor propagation throughout VK. 15 & 10 — no stations heard or worked. 2 — mainly operation on 14400 F1, some time on 14650 F1. Caused some time and time wastage when a new call sign appeared. —VK4ADC

I thoroughly enjoyed the contest and was pleased to see good manners exhibited at all times. My only problem was a computer which let me down badly two-thirds of the way through. I hope that my log-keying system will be more refined next year, but while it was running the computer really made easy work of detecting dupes. Of recent time in AR there seems to have been only one program included for contests. I wonder if you could use your influence to get a program included to cover the RD Contest and perhaps one that would run on the now very popular, Commodore 128 format. —VK6YA (Any suggestions or contributions? ? ? —FCB)

So, I guess that pretty well wraps up the Remembrance Day Contest for 1986. There were a few other comments which I have not included in this column. I am grateful for the expressions of appreciation which many letters carried regarding the duties performed by myself as Federal Contest Manager and I thank those concerned for same. I would like to say that, whilst carrying the responsibility for this function may at times seem to have some minor drawbacks, the satisfaction derived from carrying out something which I believe allows me to try and put back into amateur radio a little of what I have derived from the hobby over the past 28 years, more than repays any effort involved. Likewise, I would encourage you too in any moves towards working for the benefit of our hobby from local club level through to accepting federal appointments in our national organisations. The Wireless Institute of Australia, with amateur radio becomes in the future in this country depends on what you, the individual amateur, makes it today.

One query which has arisen, pretty well a perennial one, is the question as to why points for CW operation in the RD Contest are not worth more than for Phone contacts. Once again I must explain that:

a) The Phone Section and CW Section are totally separated. In other words, entrants in any one section are competing in the contest totally by themselves. b) More to the point perhaps, the method of scoring so as to determine the winning Division for the contest would become unbalanced should any particular mode be singled out for "loaded" points.

Yes, I can perhaps understand that there may be a certain amount of extra effort involved in making CW contacts as against phone contacts. It surely would not be a sensible thing to make each CW contact worth 100 times that of a phone contact, would it? So, if you think about it, even making the points for CW double that of Phone is also somewhat pointless. In other words, that approach would still be based on the same rationale. If you are competing in any section you are competing equally with all others, but only in that section.

I trust that you will enjoy your contesting activities during 1987.

—73 de lan VK5QX

JOHN MOYLE MEMORIAL NATIONAL FIELD DAY CONTEST 1987

CONTEST PERIOD: From 0100 UTC, March 14 to 0700 UTC, March 15, 1987.

OBJECT: To encourage portable operation on the amateur bands by Australian operators. This form of activity is intended to help operators become familiar with portable operation and thus assist in training them for preparedness in emergency situations. Emphasis is placed on working between field day/local VK stations in a manner as might be expected in an emergency situation.

CALL AREA DEFINITION: A Within ones own call area. VK1 to VK1 etc.

B Outside ones call area. VK1 to VK2; VK1 to ZL etc.

RULES:

1. DIVISIONS: There will be TWO DIVISIONS — a) 24-hours and b) 6-hours. In each division the operating period must be continuous within the time period allocated for the contest.

2. SECTIONS: In each Division there will be separate SECTIONS as follows:

- a) Portable Field Station, transmitting phone, single operator
- b) Portable Field Station, transmitting CW, single operator
- c) Portable Field Station, transmitting open, single operator
- d) Portable Field Station, transmitting phone, multi-operator
- e) Portable Field Station, transmitting CW, multi-operator
- f) Portable Field Station, transmitting open, multi-operator
- g) Portable Field Station, transmitting VHF
- h) Home Transmitting Station, emergency powered
- i) Home Transmitting Station, mains powered
- j) Receiving Stations

3. **STATION DEFINITION:** A **Portable Field Station** is one which operates from a power supply which is independent of any permanent installation. The power source must be fully portable, ie batteries, solar panels, wind or motor generators, etc. A station located in an automobile or completely self-contained, apart from antennas, is classed as being portable, whether in motion or not.

A **Single Operator Station** is one where the work involved in setting up the station is carried out by one operator and where this operator is the one who makes all contest contacts from the station. This does not, however, preclude the operator from having minimal support such as a log keeper, provision of food and drink, etc. This definition debars such practices as entering a Club Station using a single operator with massive support, in

competition with stations which are set up and operated by an individual operator in the normal sense of the word.

It is considered that the terminology of **Multi-operator Station** is self explanatory.

4. **INSTALLATION:** No radio apparatus, including mast, antennas, feeder cables, etc, may be erected on the site more than 24-hours before the contest begins operating.

5. **BANDS:** All amateur bands may be used with the exception of the 10, 18 and 24 MHz bands.

6. **CONTACTS:** Cross band contacts are not permitted. Cross mode contacts are permissible, however they will count only as phone contacts for scoring purposes.

7. **THE SIZE** of any portable field station shall be restricted to approximately that of an 800 metre diameter circle.

8. **MULTI-OPERATOR STATIONS:** Such stations will provide a separate log for each band. Only one transmitter may be used on a given band at any one time, be it operating in a phone or CW mode. Only one call sign may be used from a multi-operator station.

9. **MULTI-OPERATOR STATIONS:** The exchange between stations will consist of a number/letter combination comprising the RS/T report as applicable, followed by a serial number commencing with 001 and increasing by one for every contact. Should the number 999 be reached, the series must then be re-commenced at 001. Following the serial number, a letter must be added indicating the Section (A) through (J) in which the station is competing, eg Number sent by a multi-operator station transmitting phone for the first contact would be 59001D. Both serial numbers sent and received must be recorded in the station log.

10. **SCORING:** For Portable Field Stations — **CONTACTS WITHIN AUSTRALIA:**

a) Portable/Mobile outside entrants call area — 20 points

b) Portable/Mobile within entrants call area — 15 points

c) Home Stations/Section H outside entrants call area — 10 points

d) Home Stations/Section H within entrants call area — five points

e) Home Stations/Section I outside entrants call area — two points

f) Home Stations/Section I within entrants call area — one point

— **CONTACTS OUTSIDE AUSTRALIA:**

g) Contacts with overseas stations, ie other than VK — two points

For Home Stations/Emergency Powered — **CONTACTS WITHIN AUSTRALIA:**

a) Portable/Mobile outside entrants call area — 15 points

b) Portable/Mobile within entrants call area — 10 points

c) Home Stations/Section H irrespective of call area — five points

d) Home Stations/Section I irrespective of call area — one point

NOTE: Home Stations/Emergency Powered must operate independently of mains power. Such a provision is to further the aims of the WIA to prepare operators for emergency situations.

For Home Stations/Mains Powered — **CONTACTS WITHIN AUSTRALIA:**

a) Portable/Mobile outside entrants call area — 10 points

b) Portable/Mobile within entrants call area — five points

c) Home Stations/Section H irrespective of call area — one point

11. **VHF/UHF MULTIPLIERS:** For contacts made on frequency from the 50MHz band and upwards, the QSO points score for each contact is multiplied as per the following table:

DISTANCE	MULTIPLIER
Under 50 kilometres	1
50 — 150 kilometres	5
150 — 300 kilometres	10
over 300 kilometres	20

12. **BONUS POINTS:** For any contact made using a **NATURAL** power source, a bonus score of 10 points may be added. A natural power source is regarded as one where power is derived from such as solar cells, wind, methane gas, etc, as well as from batteries which are completely

charged by natural means. All power produced under this category must have been derived independently of commercial mains or the use of petroleum derivatives.

13. **CW CONTACTS:** CW to CW contacts earn double points. These points must be shown as claimed on the log sheet prior to the application of any multiplier or bonus points. **NOTE:** See below regarding CW Trophy under Rule 22.

14. **REPEAT CONTACTS:** Portable Field Stations and Home Stations under Section H may contact other stations within these categories (Section A to H) provided that a period of at least three hours has elapsed since the last contact with the station concerned. Home stations operating under Section I may be contacted provided that a period of at least six hours has elapsed. This applies for each band and mode. In the case of Portable Field Stations operating in the NZART Field Day Contest, repeat contacts are allowed provided a period of one hour has elapsed since the previous contact.

15. **RECEIVING STATIONS:** Stations in this section must record the serial number being sent by any of the stations operating in the contest within Sections A to G inclusive. QSO points scoring will be on the same basis as for Home Stations/Section I as per Rule 10 above. VHF/UHF Multipliers and Bonus Points as indicated under Rules 11 and 12 also apply.

16. **REPEATERS:** Operation through any active earth repeaters is not allowed for contact purposes, however, the use of such is allowable for the purpose of making contact arrangements. Contacts made using orbiting satellites or EME as a medium are acceptable.

17. **MODES OF OPERATION:** AM, FM, and SSB all count as PHONE operation. RTTY and CW are both regarded as being CW. It would not be expected that more exotic modes, such as SSTV or Fast Scan television would be used in this contest.

18. **LOG FORMAT:** All logs shall be set out under the following headings and in the order shown: Date; Time UTC; Call Sign; Band; Mode; RS/T Sent; RS/T Received; QSO Points; Multiplier; Bonus Points; Total Points Claimed.

NOTE: The last three columns need only be shown where applicable. Contacts must be listed in order of Time and Serial Number. Each log page must also carry a progressive Total Points Score Claimed at the bottom of each sheet. Scores Claimed must be calculated by first multiplying the QSO Points Score as taken from Rule 10 by any applicable multiplier from Rule 11 and then adding any Bonus Points as per Rule 12.

19. **SUMMARY SHEET:** A Summary Sheet must be included which indicates the following details: For each contact for which a multiplier is applicable, the Serial Number of the contact and also details of the respective stations locations which apply to the contact. Such details must include either latitude/longitude references for each station or some satisfactory proof by such as a map reference or distance calculation as to the distance over which the QSO was conducted. For Bonus Points to be claimed, suitable evidence must be provided by the method of Natural Power Generation employed. Such evidence could take the form of a photograph of the generating equipment used or a signed statement by another amateur showing his call sign, declaring that he has inspected the generating equipment referred to.

20. **FRONT SHEET:** Each log must be accompanied by a Front Cover Sheet which provides the following information:

Name; Address; Call Sign; Division (six or 24 hour); Section (A to J); Number of Contacts; Claimed Score. This sheet must also indicate station location, equipment used, power generating system employed and in the case of Multi-operator Stations, a list of operators names and call signs, together with their signatures.

This Front Sheet must also carry a declaration signed by a licensed amateur as follows:

DECLARATION — I hereby certify that this station was operated in accordance with the rules and spirit of the contest. Signed. Date.

21. **MULTIPLE STATION OPERATION:** In the case of operators who have entered the contest in the six hour Single Operator Section it is allowable for

them, upon their return to their Home Station, to make contacts with portable field stations. For this purpose they must submit a separate log which will be regarded as a Check Log only; ie they cannot enter into more than one section of the contest for competitive purposes. Operators who are interested in providing more field day activity are encouraged to adopt the practice where possible. It should be noted, however, that the practice of Multi-operator Station participants considering themselves to be portable stations and making contacts with the portable field contest station so as to bolster that station's score is deemed to be *not in the spirit of the contest*, and, as such, contravenes the intent of Rule 20.

22. **CERTIFICATES AND TROPHY:** Certificates will be awarded to the winner of each section both the six and 24 hour Divisions of the contest. The six hour certificates cannot be won by the 24 hour entrants. The Contest Manager also reserves the right to award other certificates where the effort made by a particular station is of special worthiness.

The Highest CW Score of the contest entitles the holder of this section of the contest entry to receive a trophy in the form of the President's Cup to hold for a period of 12 months. This award is intended as an encouragement to operators to utilise the CW mode whenever possible.

23. **DISQUALIFICATION:** The general Contest Disqualification Criteria, as published on page 44 of *Amateur Radio* for August 1985, apply to this contest. It is again pointed out that you should read the above rules properly so as to understand them and ensure that your log does comply with the contest rules laid down.

24. **LOG SUBMISSION:** Logs should be forwarded to the Federal Contest Manager, Box 1234, GPO, Adelaide, SA, 5001. The front of the envelope should be endorsed **John Moyle Memorial Field Day Contest**. Closing date for entries is April 27, 1987.

I recently received a letter from an operator who intends to enter the Field Day Contest. Amongst his queries was one in regard to the rule concerning the use of *Natural Power* and whether it is permissible for entrants to arrive with fully charged batteries and use the solar and/or wind devices to top them up during the contest.

As you must know I must admit that I have tried to steer clear of complicating the rules with too much detail, however, I had to address the query and feel that I have done so in a fair manner. So as to provide some guidance along such lines to others, I have decided to publish the relevant portion of my letter, as follows:

With regard to the matter of natural power sources, I can only put it to you in the following manner:

In any of the amateur radio contests that I know of, the organisers, and I am no exception, can only depend on the entrants themselves as far as "fair behaviour" is concerned.

To further explain this statement, one can have no real control over the actions of all who enter a contest. They could use higher power than is legal, set up where it is against the rules, use unlicensed operators or do any manner of things along such lines.

The main idea of contests is to provide fun, challenge, experience, etc, and if people wish to do things which circumvent such an approach there is not much that can be done about it. About all that I can do, as Contest Manager, is to provide a reasonable set of rules, check logs as well as I can after the event and then set the result as I see them. (At the same time, trying not to make too many mistakes).

So, having said all the above, I realise that you still need some guidance.

I have purposely, until now, steered clear of providing too much in the way of definitions and spelling things out to the last degree where rules are set after the event and the result as I see them.

In the matter of prior charging of batteries, etc, the rules may be left open to interpretation. They do read, in part — "all power produced under this category must have been derived independently of commercial means or the use of petroleum derivatives."

If taken to the extreme, one could say that commercially made batteries are produced by use of petroleum sources, etc., and thus their use should be allowed at all. However, I feel that to do so would be pedantic, to say the least.

I would prefer to leave the matter to each individual amateur to decide, based on his own fair interpretation; eg if you were running a station configuration which required an average 10 amps from the basic power source, such as a battery, and you had a nominal 100 amp-hour battery, you could expect around 10-hours of operation using same from a fully charged condition. If you attached a solar power source to the battery for charging purposes with a capability of one amp, you would not be doing it all to help your power supply problems.

Alternatively, if you provided a solar supply with a one amp capability to run a QRP rig of, say 500 milliwatts consumption, you would surely be achieving something.

Now, with respect to prior charging of the battery system, I would again leave it up to the individual.

In the first example quoted above, it would not improve the situation to any great degree unless you perhaps first of all flattened the battery completely prior to the contest and then spent the many hours charging it up using the solar source. Then you would, of course, use this battery with its slow trickle charge from your solar supply until such time as the whole system went flat. At this stage, you would go off the air as far as *Natural Power* was concerned. Possible, although perhaps a little unlikely! In the second case, even if you went out with a battery fully charged by normal means, you would obviously only be using power supplied by the solar source. In other words, the battery would be acting really as a component which provides a "filtering" function.

Thus you can see that there can be a wide range of possibilities which occur. The nature of the *Natural Power* rule is such as to encourage operators to devise new, interesting and useful alternatives for power sources.

To reiterate that one would expect those who participate in the Field Day Contest and wish to enter under the *Natural Power* proviso, to do so with a proper understanding of the rules and their aim and to conduct their entry in a fair and sportsmanlike manner.

I hope that this explanation will be of some help to you in making a decision as to how you plan your entry.

On further thought, I perhaps will publish a copy of this letter in my contest column as it may serve as a general guide to others as well as being of interest to many. In providing such comment I have followed my own self determined policy of trying to keep things as simple as possible, as well as retaining balance and fairness to all who may be concerned.

I trust that this year will see a successful start to the WIA sponsored and organised contests with the John Moyle Memorial Field Day Contest and that it will be a most enjoyable event for you. I certainly plan to be operating in the field day and I regard it as probably the best event of the year.

I will also be looking forward to receiving your comments and particularly any photographs you may send depicting your field day operations, along with your logs.

FRENCH DX CONTEST

CW: January 24-25, SSB: February 28-March 1. Another case where I did not receive the rules in time for early publication. The rules for this contest have not changed from the format last year. It is still the rest of the world working the French Europeans, as well as the other French departments and territories all over the world. The French areas can usually be identified by the letter F in the prefix.

ASSETS: Single operator and multi-operator. Multi-stations must stay on the same band for at least 15 minutes.

EXCHANGE: RS/T plus a three-figure number starting with 001. French stations will also include two figures or letters identifying their department.

POINTS: One point per contact between stations in the same continent, three points if with other continents.

MULTIPLIER: Each French European Department (95) and each overseas department and territory worked. Also DAI and DAF French Army, 2A and 2B Corsica and the Club Station F6FF.

FINAL SCORE: Total OSO points from all five bands (3.5-28 MHz) times the sum of the multipliers from each band.

AWARDS: Certificates to the top scorers in each country. European single operators must make at least 100 OSOs; multi-operators 250 OSOs. All other areas 50 OSOs for single operator, 100 OSOs for multi-operator. Stations making over 250 contacts must include a dupe check sheet with their log. The usual disqualification rules for excessive duplicate contacts and other violations will be strictly enforced. All entries must be postmarked no later than March 5 for CW and April 5 for SSB.

LOGS TO: This year's logs go to the REF Contest Committee. At: Lucien Aubry F8TM, 53 Rue Marceau, 91120 Palaiseau, France.

YL ISSB QSO PARTY

SSB: March 21-22, 0001 UTC Saturday, to 2359 UTC Sunday.

(The CW section of this contest was held from January 31 to February 1). The party is open to all, but emphasis is on membership participation.

CATEGORIES: Single operator, DX-US Partners and YL-OM Teams.

EXCHANGE: Call, RS/T, QTH (state, province, territory, district or country), Name, ISSB number, YL-OM team-mate, DX-US partner.

POINTS: One point for non-member contacts, three points for member contact on the same continent and six points if in a different continent.

MULTIPLIER: Only contacts with a member station count as a multiplier. There are 10 different categories. Get the list from WA9AEA.

FREQUENCIES: The general portions of the CW and Phone bands, 10 to 80 metres. Avoid 14.332 MHz used by the ISSB Net. Check 40 and 80 hourly.

AWARDS: Category and QTH area winners.

LOGS: Should be set out as outlined in the exchange and should indicate at least two six-hour periods.

SUMMARY SHEET: Showing the scoring and other essential information would be helpful. Mailing for all entries is April 30 1987 and they should be mailed to: Bill Early WA9AEA, PO Box 401, McHenry, IL, USA. 60050-0401.

(Note: Rules and logging format are much too lengthy and complicated to list here. Strongly suggest that if you are interested you send a large SASE to WA9AEA for more details).

RSGB 7MHz SSB & CW CONTESTS 1987

All licensed amateurs are eligible to enter this contest.

TIMES — SSB: from 1200 UTC, February 2, to 0900 UTC February 8, 1987.

— CW: from 1200 UTC February 28, to 0900 UTC March 1, 1987.

BANDS — SSB: 7.040-7.100 MHz; CW: 7.000-7.030 MHz.

EXCHANGE — RS(T) plus serial number commencing at 001. When received, serial numbers from non-competing stations must be recorded.

SCORING — Non-European stations with British Isles stations 15 points per QSO. Note: contacts with aeronautical and maritime mobile stations will count five points per QSO, but not for multipliers.

MULTIPLIERS — Multipliers may be claimed for each British Isles prefix worked: G0, G2, G3, G4, G5, G6, G8, GD0, GD2, GD3, GD4, GD5, GD6, GD8, GI0, GI2, GI3, GI4, GI5, GI6, GI8, GI0, GJ2, GJ3, GJ4, GJ5, GJ6, GJ8, GJ0, GM2, GM3, GM4, GM5, GM6, GM8, GU0, GU2, GU3, GU4, GU5, GU6, GU8, GU0, GU2, GU3, GU4, GU5, GU6, GU8. In all a maximum of 49 can be claimed. Note the prefix GB cannot be claimed as a multiplier.

FINAL SCORE — QSO points multiplied by the number of multipliers claimed.

LOGS — Log sheets should be headed date; time (UTC); call sign of station worked; RS(T) and serial number sent; RS(T) and serial number received; multiplier if claimed and QSO points. A separate sheet showing countries/areas worked is also required. Unmarked duplicate

contacts for which points have been claimed will be heavily penalised and logs containing more than five will normally be disqualified.

DECLARATION — Each log must be accompanied by the declaration: "I declare that my station was operated in accordance with the rules of the contest and in accordance with my license." The declaration must be signed and dated.

ENTRIES TO BE SENT TO — RSGB HF Contests Committee, PO Box 73, Lichfield, Staffs WS13 6JJ, England.

CLOSING DATE — SSB logs must be received by March 30, 1987. CW logs by April 27, 1987.

RECEIVING SECTION Rules for the receiving section are the same as for above except as superseded below.

SCORING — Listener logs log only British Isles stations operating in the contest, and claim 15 points per QSO logged.

MULTIPLIERS — Are the same as for the transmitting section.

LOGS — Logs should be headed date; time (UTC); call sign of station heard; call station of the station being worked; report sent by station heard; multiplier if claimed and QSO points. In the column 'station worked' the same call sign may only appear once in every three contacts logged unless it is a new multiplier.

NOTE: VK3XB was listed as 14th in the 1986 Rest of the World CW Transmuting scores with a total of 660 points. The winner of the G6OB Trophy was Steve Taylor G4EDG. The SSB section winner was Keith Ginder G3NAS.

NATIONAL SPRINT — 1986 RESULTS

Results of the inaugural National Sprint Contests, held on November 15 and 22, last year, have now been compiled. On behalf of the Adelaide Hills Amateur Radio Society and the VK5 Division of the WIA, congratulations are extended to the winners of the two trophies.

Overall winner of the 1986 National CW Sprint, and recipient of the trophy, was Ivor Stafford VK4VJG of Box Hill. His log included more than five DX contacts (three of them North America), which is an indication of what can be done with CW on 80 metres.

Overall winner of the 1986 National Phone Sprint, and recipient of the trophy, was John Hampel VK5SJ, of Glenowrie. John's log may, in part, be attributed to his almost constant presence on 80 metres in support of South Australia's J150 activities — and a lot of persistence.

The Sprints are regarded by the organisers as having been an outstanding success, and this feeling is echoed by many of the participants (see comments below). It is hoped that a suitable pair of weekends in July can be found for the 1987 event, on the basis that propagation may be better and the luck of the draw may be better. It may persuade a few more VKs to participate. Consideration is also being given to shortening the contest period to one hour.

As the entries show, there was a high level of participation by Novices, and many operators (not just the Novices) stated that it was the first contest they had ever entered. Amateurs in all call areas participated, though not all submitted logs. It was interesting to note the level of participation in the CW Sprint from VK4, which will take some beating next time.

Congratulations to all certificate winners, and thanks to all participating stations.

In the following list of logs received (printed in order of call sign and points claimed), an asterisk indicates the winners of certificate or trophies.

1986 NATIONAL CW SPRINT RESULTS

VK2CDG	7		
VK4VJG	10	VK4OL	23
VK2AIB	18	VK4VAD	25
VK2ACZ	32	VK4OD	25
VK2ZC	*	VK4APZ	*
VK3AUO	12	VK5TI	21
VK3CGH	26	VK5AD	31
VK3UJ	29	VK5ZD	37
VK3XB	38	VK5FN	37
VK4NCL	10		
VK4X/WM	12	VK6AFW	14
VK4BHR	14		

VK4QY	20	VK7VQRP *	21
VK4SFQRP	21		
VK4TT	22	VK8AV *	17
VK4BRZ	22		

VK4BHR, earned his certificate for perseverance and preparedness — main power supply was lost at the start and he continued on battery power.

Operators' comments (CW Sprint)

VK2CDG — As a shift worker this concept may give me the opportunity to enter more contests.

VK2ZC — Do hope in future events that more starters show up — no doubt they will as the contest becomes known.

VK3AUG — Good points — Bad points — when I think of one I will let you know... hope you run it again in future.

VK3QCN — A superb idea! I had a lot of fun taking part in the first CW contest... tried the CQ WW Test and got less contacts in 48 hours than I did in the 45 minutes of the Sprint.

VK3XB — It was a good idea.

VK4NCM — I think I've ever been in... An interesting exercise.

VK4BHR — Never participated in a contest previously... the time had something to do with it... blew a fuse from the world go and operated from standby battery.

VK4QY — It was most enjoyable, and everyone that I heard played the game fairly and squarely... Once a year not often enough... how about every six months?

VK4SFQRP — ... great idea, and such a convenient time... haven't heard the band so alive with so many CW signals since the RD test. Hope you can hear many more.

VK4BRZ — Great idea! Hope to hear it on the next year, etc!

VK4APZ — ... An event which I very much enjoyed... We all had lots of fun, and look forward to next year's contest.

VK5TI — It was a great idea, CU NKT year.

VK5ZN — It was a lot of fun and I sure look forward to the next.

VK7VQRP — ... certainly enjoyed it, something to be said for a short period scramble... Hope it grows each year.

1986 NATIONAL PHONE SPRINT RESULTS

VK2ZNU	13		
VK2CJH	18	VK5KGS	22
VK2AIC	21	VK5FN	32
VK2ENX	27	VK5ADX	37
VK2LEE	29	VK5SY	40
VK2BOS	31	VK5GX	40
VK2CDG *	37	VK5VD	44
	40	VK5SU *	71
VK3JA	37		
VK3CRA *	40	VK6AFW	11
		VK6LD	22
VK4OL	13		
VK4BIL	16	VK8AV *	24
VK4OD *	31		

Operator's Comments (Phone Sprint)

VK2BOS — An interesting contest and very enjoyable perhaps the WIA should include the "small ones" with the (register of contests) in the Call Book.

VK3CRA — ... two things going for it — short time period and extremely simple rules/scoring... hope you persist with the event...

VK4BIL — I'm not normally a contest man but I reckon the idea was great... thanks for a lot of fun.

VK4OD — ... thoroughly enjoyed them both, especially the CW. Perhaps it would be better to drop the signal report... just a number exchange. All seem to give 589 even if they can just read you 438!

VK5GX — Enjoyed the short, sharp contest for the first part... became somewhat boring towards the end. Maybe it could be reduced to about half an hour... eastern States should have an advantage... might receive more entrants during the winter months.

VK5AYD — ... enjoyed the spirit of the contest... Definitely a good thing, see you next year.

—Results supplied by Marshall Emm VK5FN, President, Adelaide Hills Amateur Society Inc



Spotlight on SWLing

Robin Harwood VK7RH

52 Connaught Crescent, West Launceston, Tas. 7250

Well, we are well into 1987 now. The Test Cricket has come and gone and the finals of the One Day series are about to be held. So too, has the Davis Cup. I cannot comment on the winners or losers, because as you can see, these are not known at deadline time. Radio Australia has been airing ball-by-ball descriptions live on 15.415 and 21.525 MHz. These come in handy for some of us, as the local television station decided not to telecast the Davis Cup, which certainly upsets my locals.

This meant going back to the radio descriptions, which brought back a lot of memories of the good old days, when the whole country was riveted to Ted Schroeder's descriptions of the exciting Davis Cup tests from Kooyong or White City. Why I sought the RA cricket descriptions was because the local ABC domestic networks were not broadcasting live commentaries, because of parliamentary commitments or public affairs programming.

I am one of those televisioners who prefer to hear the radio commentaries, rather than the comments of Grieg or Chappell. But I do not think the ABC team is as good minus Alan McGilvray. Yet, I still prefer the audio to be constantly interrupted by extremely noisy commercials, in between overs. I also follow the descriptions of test matches in other countries, via shortwave. For instance, I was recently able to follow the tour of the Australians in India and the West Indies tour of Pakistan. There were some commentaries, but the commentators often broadcast in languages other than English. This winter, I expect that I shall be able to follow the test matches in England via the BBC World Service.

And whilst I am referring to the BBC World Service, I have received some advance information on their February programming. In January, they commenced a weekly program called "Computer World." Hosted by Hamish Robertson, this program aims to keep pace with the fast-changing world of information technology and other developments in micro-computers. Each program has been designed to keep the listener abreast of the latest developments, as well as assess the implications of the growing convergence of computers and information technology. You can hear the program at 2315, Mondays. It is repeated at 0145 and 0730 on Tuesdays. (Incidentally, all times quoted in this column are in UTC, unless otherwise stated).

Another program dealing with the wider field of technology for the 21st Century will be discussed by the BBC Science Unit from February 12, at 0145 or 0945.

The program "Assignment" will be reviewing the year of Cori Aquino's presidency of the Philippines during February. It can be heard at 2030 Wednesdays and repeated at 0230, 1130 and 1615. February 8, 1987, is the 400th Anniversary of the last queen of Scotland being beheaded. This was at the instigation of her

cousin, Elizabeth I of England. This program traces the tragic story of her 44 years of life. You can hear it at 2330, Tuesday, February 10, or 0330, Thursday, February 12.

Incidentally, I do notice that the BBC are recommending some additional frequencies that can be tried for this area. 9.915 MHz, is available from 2200 until 0330 from a UK site. 7.325 MHz from 2300 until 0100 UTC.

By-the-way, I also noted that the BBC World Service is now regularly on 18.080 MHz from 0900 and comes in very well here. This sender formerly carried the BBC Asian Service and is located at Daventry. It certainly assists me to have what sites they are using, which I obtained from the International Listening Guide and not from the official BBC schedule.

Have you heard those weak stations with extremely bad audio down amongst the 7 MHz CW segment? Well, they have now been positively identified. The one that floats around 7.052 MHz is the clandestine Voice of Malaysian Democracy, in Chinese and Bahasa Malay. It is unstable in frequency and is heard around 1130 UTC. The other station is further away in Sri Lanka, or in south-east India, near Madras and is on 7.010 MHz. It calls itself The Voice of Tamil Eelam and has been heard in Sydney, by Patrick McDonald, in English at around 1330.

I am also led to believe that they even have an address in Madras, yet the Malaysian clandestine does not have any, reportedly broadcasting from the Malaysian-Thai border.

Usually, my practice is to ignore pirate stations but I am interested in clandestine outlets. Remember a few years ago, I mentioned that I received the anti-Castro Clandestine La Voz del CID, on 10 MHz and got a QSL card back in 18 months, after dispatching a report to their New York offices. The reply came from Costa Rica with no forwarding address. Later, they are rarely heard because the US Government has an official anti-Castro clandestine voice — Radio Marti which is a part of the VOA operations.

I do recommend that you keep monitoring down around 6.2 MHz in our winter for some of the Central American clandestine outlets in Honduras, El Salvador and Costa Rica. The clandestine that is heard very well is on 4.120 MHz at 1200 UTC, is in Korean with the call sign of The Voice of Reunification. It claims to be in Seoul, South Korea, but is, in fact, in North Korea as intermodulation from another North Korean sender has been detected under the modulation. Also, programming is favourable to the north. The South Koreans have replied with a clandestine of their own — Radio Echo, on 6.348 MHz at 1000 UTC.

That is all for this month. Until next time, the very best of 73 and good listening! — Robin VK7RH.

What, I hear you asking yourself, is he doing showing the obverse of a common-or-garden Jersey penny piece!

Well, in fact, this little coin is far from ordinary, for it is the only coin in the world that depicts an amateur radio station!

The Hocq Tower is the headquarters and station for the Jersey Amateur Radio Society (JARS, as they are affectionately known), and it is here that they send and receive messages to and from all over the world.

Mr Ken Kirk-Bayley, is both a committee member and their PR man, and he is kept busy with the 70 or so overseas visitors which they get every year. The nice thing about amateurs is that,

although one may be meeting an American, Japanese, Australian or whatever, for the first time, the stranger in the flesh may be a very old friend on the air. It is a hobby where there are no boundaries of country, race or creed.

One of the most amusing things about the Jersey penny is that Americans happily pay \$1 for it in order to get it as a keepsake. JARS (call sign GJ3DVC), receive many letters asking for one of the little coins which include a dollar bill to cover postage.

So when you dig into your pocket for change and see those small coins, don't cuss them and say how small and useless they are. To many, they are little works of art to be treasured as a picture of the amateur station in "old" Jersey.



AMATEUR RADIO TOWER!

The following is a small article which appeared in the local press of Jersey, Channel Islands, Great Britain, received by Jack VK1LF from his niece, a resident of Jersey. Jock is an OT who held the call sign, GM4MV, in 1937 and still retains a call sign, GJ4MV, when he visits Jersey.



Education Notes

Brenda Edmonds VK3KT
Federal Education Officer
PO Box 883, Frankston, Vic. 3199

The insert in January AR notified members of DOC's proposal for devolvement of the Amateur Operator Examinations.

I think we must accept that the Department is unlikely to continue the present examinations system indefinitely unless fees are increased even more, to close the gap between examination costs and revenue. Figures quoted by DOC for the February 1986 examinations show a total cost of over \$66 500, receipt of less than \$11 000 from fees. Although we may query the data used in arriving at this figure, it is apparent that the examinations have been a significant cost to the Department for many years.

The insert also noted the Executive's concern with the problems likely to arise if a large number of bodies are accredited as examiners. Some of these problems have been elaborated in a circular to divisions and clubs. Any members interested in this circular, but not having access to it, are welcome to request a copy from me.

Briefly, we are concerned that broad devolvement will lead to erosion of examination standards, and variation between standards established by different bodies; also that classes run by bodies with access to the Question Bank may be taught with reference only to the Bank and not to the whole syllabus. We are also concerned that the examinations may be seen as a source of revenue for individuals or institutions, so leading to high or uneven charges for them, and that the

geographic spread of examining bodies may make things difficult for candidates in remote areas. Problems will also arise with CW examinations, and with maintenance and updating of the Question Bank if it is relaxed.

We see it as vital that the examination system should be fair and equal for all candidates in both content and accessibility, and that the exams are available at reasonable frequency and cost.

I have previously raised the possibility of clubs or individuals being involved in the conduct of examinations set and marked by the Department. Most of the responses I received accepted this as a possibility, and several groups expressed willingness to assist. If DOC is prepared to continue to produce the papers, but allows the Institute to participate by arranging times, venues and supervisors, we would have the potential for exams by mutual agreement to suit a particular group or class, at weekends or in the evening. This is very nearly the 'exams on demand' for which we have been asking.

Other possible arrangements have been discussed at Executive meetings, including the American system of using registered Volunteer Examiners. Some of you may have seen the article on this system in CQ last November. This system might be less satisfactory here with only two grades of theory. We have also considered the idea that the Institute should accept the full responsibility for the whole examination system on a non-profit-making, but cost-recovery basis.

DOC has set a deadline of March 1, for submissions in response to their devolvement package. We would like to have as many replies as possible from members and groups by early February, so that opinions can be collated. Please give this matter your consideration and forward your views to your Federal Councillor, or to me. ASAP. Non-response will be assumed to mean that you will be satisfied with whatever action is taken by the Executive.

This is probably the most significant change to our hobby since the introduction of the Novice Licence. It is essential for the future of amateur radio that the Institute presents a logical, reasoned and reasonable submission that has been based on wide canvassing of members' opinions.

I would like to thank all those who have already responded to my requests for opinions or offered comments on various educational issues. I am sorry that I do not always have time to reply individually, but your voices are being heard.

If you would like to discuss the above matters, the Education Net will be back on-air from February onwards — Thursday 1130 UTC, 3.680 MHz ± QRM. If writing, please note the new Post Office Box number above.

Best wishes to all sitting for the February exam. Remember — **read the question, and all the alternatives.**

—73 Brenda VK3KT

AMATEUR & NOVICE AMATEUR OPERATOR'S CERTIFICATE OF PROFICIENCY EXAMINATION RESULTS

August 19, 1986

CANDIDATES	NSW	ACT	VIC	QLD SA/NT	WA	TAS	TOTAL
Section "M" (Theory) AOCP							
Sat	80	7	75	58	37	31	5 293
Passed	31	2	36	17	17	12	3 118
Section "O" (Theory) NAACP							
Sat	44	1	60	34	16	17	8 180
Passed	20	0	28	22	7	9	6 92
Section "K" (Regulations) AOCP & NAACP							
Sat	56	3	68	34	17	15	6 199
Passed	41	2	49	26	15	8	6 147
Section "LS" (Telegraphy — Sending) AOCP							
Sat	15	2	23	19	7	9	4 79
Passed	14	2	19	17	7	7	3 69
Section "LR" (Telegraphy — Receiving) AOCP							
Sat	32	5	49	28	12	15	5 146
Passed	11	1	16	13	6	3	1 51
Section "NS" (Telegraphy — Sending) NAACP							
Sat	23	0	39	20	7	12	0 101
Passed	22	0	37	19	6	7	0 91
Section "NR" (Telegraphy — Receiving) NAACP							
Sat	31	1	44	22	10	14	4 133
Passed	19	0	28	22	1	6	3 79

November 18, 1986

CANDIDATES	NSW	ACT	VIC	QLD SA/NT	WA	TAS	TOTAL
Section "M" (Theory) AOCP							
Sat	86	8	90	62	41	38	6 331
Passed	40	2	28	23	14	13	1 121
Section "O" (Theory) NAACP							
Sat	49	6	66	35	30	20	12 218
Passed	28	4	31	19	11	4	116
Section "K" (Regulations) AOCP & NAACP							
Sat	45	4	76	34	28	27	13 227
Passed	30	2	60	19	26	20	7 164
Section "LS" (Telegraphy — Sending) AOCP							
Sat	26	4	25	14	8	9	4 90
Passed	17	2	19	10	7	5	4 64
Section "LR" (Telegraphy — Receiving) AOCP							
Sat	34	6	44	29	16	22	5 156
Passed	19	0	19	8	5	8	2 61
Section "NS" (Telegraphy — Sending) NAACP							
Sat	24	5	13	13	15	14	0 97
Passed	18	4	23	10	11	6	0 72
Section "NR" (Telegraphy — Receiving) NAACP							
Sat	33	5	41	17	18	28	0 142
Passed	18	4	27	9	10	14	0 82

LOUD SPEAKER — WORLD'S LARGEST 35 Foot Horn

loudspeaker of rather startling proportions is used.

"The horn of this instrument is 35 feet long and the mouth is 12 feet square. This huge horn is in successful daily operation and the area over which it is heard has been computed as 29 square miles.

"Apart from its huge size, this loudspeaker, which is claimed to be the world's largest, is of absorbing interest, because of the facts that through the use of the electro-dynamic reproducer

such true tones have been produced and there is practically no distortion."

Readers should note: The PA valve had only just come into common usage in 1922. They were inefficient by modern standards. A large number would have been needed to drive the above speaker.

—Published in Wireless Weekly November 17, 1922 and contributed by Alan Shawsmith VK4SS.

—(From Wireless Weekly Special Correspondent)

"At Idora Park, a public amusement resort in California USA, wireless music is received and in order to make it audible over the whole park, a



TECHNICAL MAILBOX



RETRACTION OF ADVICE!

Ted VK4AEM, VK2DCF and Ken VK2ATK, have all written regarding the "advice" given in the October 1986 Mail Box pertaining to breakers.

Unfortunately, it seems that the "advice" given was taken seriously! Perhaps we did err in this instance but it was hoped that the message would get across that to break into a conversation should not be treated lightly. It certainly was not the intent to point criticism towards another country. As one writer states we certainly "do not have a corner on arrogance in amateur operating". How true!! If we did cause offence to any of our readers we apologise. It was hoped that the "advice" would have been seen as intended... "tongue in cheek".

PREVENTATIVE MAINTENANCE THAT WENT WRONG

VK4AFO, Malanda, Qld.

Aub, obviously mindful of the requirement for preventative maintenance on his TS-530S, has written detailing a "wild goose-chase fault" that overtook his rig unexpectedly.

Aub gives us a blow by blow description of how and why "the lights went out on his TS-530S."

For space considerations, here is his abbreviated story.

Inspection of the single fuse in the active mains lead following the failure revealed that it had expired rather violently. Replacing the fuse and trying again (tut tut!), served only to confirm he still had a problem! It was significant that the power switch (S9) had not been turned on. This observation narrowed the fault to the primary side of the transformer and indicated that the RF line filter capacitors or (shudder) the power transformer were faulty.

Aub then checked (with a multi-meter), from chassis to AC active lead and observed what appeared to initially be a dead short. This "short" however, was observed to increase in resistance indicating that a large filter capacitor was in fact being measured. This on the primary side of the transformer you may well ask!!

It turned out that, after cleaning the fan, Aub unfortunately allowed one leg of the 100 volt AC fan winding to come in contact with a 6146 plate cap. The insulation ultimately failed and thus a connection was made between the HT filter capacitor and was reflected in the "strange" multi-meter reading. Fortunately, the fault was resolved with out any permanent damage to any component.

The moral surely is, when carrying out such necessary preventative maintenance, exercise all care. Do not keep feeding fuses into the rig but look for the fault in the dormant state. Finally, what appeared to be a strange multi-meter reading had a most logical conclusion. Thanks Aub.

BATTERY CHARGERS

VK3. . . Box Hill, Victoria

"Can I run my two-meter transceiver by using power from a 12 volt battery while the charger is connected? Are there any traps in doing this? I have heard some chargers can put out more than 12 volts. Is hum a problem?"

Well Ross, you probably have read in the Technical Mailbox, October 1986, of our response to a similar question which covers, in part, what you have asked.

It may be advisable to enhance the point of employing a battery charger floating the battery whilst running the rig.

Having what could be typical of commonly available battery chargers, purchased from an Australia wide retail chain (a CW go ahead!), I decided to investigate further.

I disconnected the rigs and my 35 amp regulated supply and then connected the charger. I then fired up the CRO, checked the calibration and connected it across the battery. The charger leads were just over a metre in length and of wire that I would not have used for a five amp charger.

The picture that presented itself on the CRO was somewhat more dramatic than I anticipated.

Firstly, the ripple (noting that the battery is one sizable capacitor) was in the order of 2.5 volts peak-to-peak (as referenced to a DC voltage of 15.8 volts). The latter was a little difficult to ascertain due to the ripple content.

Not good! — but on closer inspection (by winding up the CRO intensity) spikes were evident. They were extremely narrow but their magnitude was alarmingly high. These spikes were in the order of +22.5 volts.

Ross, I think this provides you with the answer: a the ripple will certainly enhance the possibility of hum appearing on your transmission, b the spikes may just prevent your hum problem as the rig may have expired beforehand!!

Naturally, one cannot say that all rigs will be prone to such problems for power supply design (internal regulators), output transistors or RF/AF module characteristics, etc. all will have a bearing on their susceptibility to the ripple or spikes. However, it is clear that using a battery charger whilst operating the rig could be tempting fate.

My battery charger will ever remain as originally purchased — for the car alone, but this raises another point... What about all those ICs in the car electronics if you just happen to have the ignition turned on...?

As readers are now aware, we aim to include Technical Tips in this segment. If you have anything that would benefit us all please do not hesitate to drop us a line.

Following are a couple of tips from Gordon McDonald VK2ZAB, with our thanks.

FEEDING HELICALS

Text books tell us that standard, end-fire helical antennas have a feed impedance of about 138 ohms.

It is important to realise that this impedance is obtained at the periphery of the helix only and if the end near the back screen is bent in to the centre to meet with a coaxial connector mounted there, the feed impedance seen by the feeder will not be 138 ohms.

Furthermore, radiation from the bent section will interfere with radiation from the helix proper to the detriment of the pattern and overall performance of the antenna.

It is better practice to mount the coaxial connector in the back screen off centre so that the helical meets it without becoming non-helical. The impedance seen will then be about 138 ohms and any matching section required can be mounted at the rear of the screen without distorting the antenna pattern.

ANTENNA CONNECTOR SEALER

Densco tape is a loose weave fabric thickly impregnated with brown, sticky, waxy goo. It is waterproof, stays soft and waxy for years, even when exposed to the weather and is used in flashing applications by the building industry.

It seals connectors and joints in cables and on antennas; really well.

First wrap the connector and cable junction with ordinary paper masking tape and then apply a layer of Densco tape over the lot. Smooth the waxy goo into a fissure-free blob and that's it! (I wrap the

blob with black insulation tape to prolong its life and improve the appearance — Tech Ed).

It not only works, it is cheap, easy to apply, easy to remove and no bird in its right mind will touch it!!

FLOPPY DISCS

Now a couple of pointers from your Technical Editor on Floppy Discs.

For those of you who regularly send discs through the mail, you will no doubt have experienced the problem of "folded discs." Mark your package *Do Not Fold* or whatever, seems only to exacerbate the situation, regardless of the packing material used. Apart from using quarter steel plate, which would be slightly expensive on postage, one will eventually receive a disc folded in half! Generally, trying to straighten the disc is not too successful as it tends to bind within the envelope and thus slips on the drive hub, resulting in read errors.

Do not shudder, but as a final resort, carefully remove the envelope and even more carefully insert the disc into the drive. Ensure it is sitting centrally on the hub of the drive and then close the door. Copy the now "most floppy disc" onto another good disc. I have used this method many times and can assure you it does work!

Finally, avoid "storing" discs under a heavy object (like a book!) or posting between flat surfaces (aluminium sheet) or you may have to resort to recovery methods as detailed above. Corrugated cardboard boxes cut into squares provide a more satisfactory packing material.

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AMBA/2

AMSAT Australia

Colin Hurst VK5HI

8 Arndell Road, Salisbury Park, SA, 5109



NATIONAL CO-ORDINATOR

Graham Ratcliff VK5AGR

INFORMATION NETS

AMSAT AUSTRALIA

Control: VK5AGR

Amateur Check-In: 0945 UTC Sunday

Bulletins Commence: 1000 UTC

Primary Frequency: 3.685 MHz

Secondary Frequency: 7.064 MHz

AMSAT SOUTH WEST PACIFIC

Control: John Browning W6SP

Bulletins Commence: 2200 UTC Saturday

Frequency: 14.282 MHz

Participating stations and listeners are able to obtain basic orbital data, including Keplerian Elements from the AMSAT Australia Net. This information is also included in some WIA Divisional Broadcasts.

ACKNOWLEDGMENTS

Contributions this month are from Bob VK3ZBB, and due to Colin VK5HI's absence in Japan on business, mainly UoSAT-OSCAR 11 Bulletins covering amateur satellite activities during December 1986. The reason for what must seem old news in this column is that copy has been in Melbourne no later than January 2, 1987 for the February issue of *Amateur Radio*. This was the main reason for the introduction of the AMSAT-Australia Newsletter, namely to supply up-to-date information. An information received up to, and including the last Friday night of the month, can be included in the Newsletter, as it is printed in that night and posted the next morning at the Adelaide GPO. To subscribe to the monthly eight-page Newsletter, send \$20 to: AMSAT-Australia, C/- Box 1234, GPO, Adelaide, SA, 5001.

QRP MEANS 100 WATTS EIRP OR LESS — Graham VK5AGR

Since the return of OSCAR 10's Mode B transponder to full time high power operation on December, AMSAT has asked that only QRP power be used on the uplink of OSCAR 10's Mode B transponder and that the transponder should not be used at all from MA 200 through perigee to MA 20 as the spacecraft will be in solar eclipse for at least 60 minutes per orbit during this period.

EIRP is an acronym for Effective Isotropic Radiated Power and is basically equal to the 'power' being fed to an antenna multiplied by its 'gain'.

The major error most people make in calculating EIRP is that they just multiply the power to the antenna by the 'gain' of the antenna in dBi or dBd or dBc. This is only correct for one special case and that is when the antenna 'gain' is quoted at 0 dBi. In other words, 10 watts to a 10 dBi 'gain' antenna does equal 100 watts EIRP. However, 10 watts to a 13 dBi 'gain' antenna equals 200 watts EIRP. Not 130 watts EIRP, because 13 dBi equates to a power ratio of 20, not 13. See the table below:

GAIN (in dBi)	POWER RATIO
10.0	10
13.0	20
14.8	30
16.0	40
17.0	50
17.8	60
18.5	70
19.0	80
19.5	90
20.0	100

Therefore, a station running 10 watts to a KLM 18C is not running QRP; ie 100 watts EIRP or less) because the KLM 18C quotes a 'gain' of 12 dB which is greater than 14 dBi or a power ratio of 25, which multiplied by 10 means at least 250 watts EIRP.

Please check your station's EIRP — 73 Graham VK5AGR.

UOSAT-OSCAR-11 Bulletin-065 November 27, 1986

CCD Experiments

Tests of the UoSAT-2 CCD are under way, with some encouraging results returned on Monday 24/11/86. The Diary has been programmed to take

CCD images when UO-11 is over the terminator (twilight line), and these images have been examined by experimenters at UoS. The UO-11 CCD camera is very sensitive and overexposes quite easily. Until we have arrived at the correct exposure, combined with good satellite pointing and good ground weather (to give land/sea/cloud boundaries), we will not be sure how well the camera and the DSR systems are working. Listen on 435 MHz for test transmissions.

Digitalker

The published UO-11 schedule now includes Digitalker on Wednesdays, since UO-9 is no longer 'visible' during normal school hours. OBC programmer, Steve Holder, has been working on software to test the UO-11 Digitalker and eventually allow it to read out a stored message. The first stage of this test was carried out on 25/11/86, when the Digitalker was turned on for an orbit and its vocabulary was tested. If all goes well, the Digitalker should be sending a meaningful message before long.

Battery Voltage WOD

Wednesday, November 26, saw the first of a special series of WOD surveys aimed at assessing the effect on the UO-11 batteries of having both the 70 cm and two metre beacons on. Both beacons were turned off from 0000 UTC, November 26, and run for 12 hours. The 10 hour WOD dump of channel 52 (battery voltage) clearly showed a discharging trend superimposed on the normal charging/discharge cycle caused by the satellite leaving/entering eclipse. The long-term discharge was not dangerous, and a longer period of operation with both beacons on will be attempted next week. Power budget is closely coupled with spacecraft attitude, and when UO-11 lost gravity lock last month, the dual-beacon operation discharged the batteries very deeply.

FO-12 Recharging

The JAXA report that FO-12 was turned off for six days, from November 22 to November 28, for battery recovery. No further information was included, but it is possible that extended operation of the JTD digital transmitter caused deep discharge of the FO-12 battery. FO-12 operates with a negative power budget (more power being consumed by the transponders than generated by the solar cells) in all but the most favourable configurations of orbit geometry and transponder loading.

AO-10 Recovery Effect

As reported in last week's bulletin, the AO-10 transponder is now available for limited QRP use. No schedule has been announced, as transponder operation is often interrupted by control station activities. If you use the transponder, use only low power and listen to the satellite nets and UO-11 Newsflashes for latest information.

There has been an interesting twist in the AO-10 recovery program. All efforts to this time have concentrated on using the first 512 bytes of the IHU memory, since this is the memory into which the 1802 computer will automatically load uplinked data. Through the unlagging efforts of the AO-10 command stations (DB2OS, ZLIAXH and VK5AGR), the whole 14 kbytes of IHU memory were tested. Several blocks of the higher memory were in much better condition than the lower area. If programs can be loaded into this high memory, there is hope of bringing the satellite further under control.

UOSAT OSCAR-11 Bulletin-066 December 4, 1986

CCD/DSR

The CCD exposure tests carried out over the last week have resulted in some interesting data, but none conclusively showing a working imaging system. Part of the problem is in the display system used at UoS. The 127 Grey Levels available from the CCD camera have to be compressed into only four display colours. The

addition of a new graphics board to the CCD display system should solve this problem shortly. Further tests will have to wait until then. In the meantime, the DSR will be used to download both high-resolution magnetometer data and ASCII text, digitalisation reports during the upcoming data liberation tests.

Digitalker

The Digitalker will be turned on for Wednesday (UTC) 10/12/86, sending a stored message. Should this test go well, the Digitalker will be on every Wednesday, primarily for classroom demonstrations of UoSAT-2.

Reports

We received a most interesting update of activities at the Sir William Turner's Sixth Form College (UK) who, you may remember, won the prize for the best educational use of UoSAT-1 in 1985. First and second year students are involved in tracking UoSAT-2 and receiving/decoding telemetry. Bulletins and WOD as part of a Liberal Studies Course — using a hand-steered five-element Yagi antenna. The UoSAT team would like to congratulate the students and staff at the college on their enthusiasm and example. We would be most interested to hear from other schools/colleges who are actively tracking UoSAT-1 or 2. Please enclose a short description of your station and activities with UoSAT — a photograph would be interesting too!

UOSAT-OSCAR-11 Bulletin-067 December 11, 1986

CCD

This week the UoSAT Unit received an 'Extended Graphics Adapter' for the IBM-PC-Clone which displays UO-11 CCD images. Team member, Jacky Radbone, made the appropriate modifications to our display software and we were finally able to look at UO-11 CCD images in more than four colours! We are now analysing several interesting images taken automatically by the camera over the terminator (twilight line) in North America. When the UO-11 CCD system is pronounced fully operational, details of receiving and decoding the images will be published. We will need a little more time before this can be done.

WOD Surveys

There were a couple of very interesting surveys this week. First, the magnetometer survey which was dumped on Saturday (06/12/86), showed a unique event now under detailed study: Midway through the survey, the spacecraft spin period slows down, and 'oscillations' begin on the magnetometer channels. There were no magnetometer firings during this period. A special WOD survey was initiated (Thursday 11/12/86) to attempt to capture this type of event again, and to determine whether it is correlated with battery charging. Charge currents of several amps can flow when the satellite leaves eclipse, and these currents might have been able to 'magnetize' UoSAT-2! According to UoS Attitude Determination and Control expert, M S Hodgart, when the spacecraft is spinning slowly (as it was at the time of the survey), only small torques are needed to change the spin rate significantly.

The other important WOD survey this week was that collected and dumped on Wednesday (10/12/86). This single-channel (52) survey was used to measure the effects on UoSAT-2 batteries of simultaneous operation of the 70 cm and the two metre beacons. Dual-beacon operation started at the beginning of the survey, and lasted for 18 hours (about three-quarters of the survey). A steady discharging trend can be seen during the whole of the 18 hour on period, with rapid recovery after the 70 cm beacon was turned off. This 18 hour test came close to bringing the batteries into the 'danger zone,' and as a result of this experiment, dual-beacon operation will be limited to 12 hours from 0000 UTC to 1200 UTC on Wednesday.

25TH ANNIVERSARY OF OSCAR-1

OSCAR-1, the first amateur radio satellite, was launched at 2042 UTC on December 12, 1961 aboard *Discoverer-36* from Vandenberg Air Force Base, California. Built by members of the OSCAR Association, this small satellite was to prove the inspiration for a steady stream of amateur radio satellites produced and launched by nations around the world over the next 25 years. Weighing only 10 lbs, OSCAR-1 carried a 140 mW CW beacon transmitting "HI HI" on 145 MHz at a speed dependent on the internal satellite temperature and powered by a small battery. OSCAR-1 transmitted continuously for 22 days before burning up during re-entry into the Earth's atmosphere. More than 570 amateurs from 28 countries forwarded reception reports to Project OSCAR, providing information on trans-ionospheric radiowave propagation, and the satellite's orbit and thermal design.

The Amateur Satellite Service has come a long way since those early days — with highly sophisticated spacecraft in a variety of orbits today such as UoSAT-1 and 2, AO-12, FO-12 and the RS satellites providing a wide range of complex communication and experimental functions more advanced than the "primary" payloads contemporary to OSCAR-1! We should, perhaps, pause and acknowledge with thanks the small body of enthusiasts world-wide that have devoted so much

time and energy to the design, construction, test, launch and orbital operation of the 20 amateur radio satellites that have flown over the first 25 years of the Amateur Satellite Program. We should also not forget the many thousands of amateur experimenters who have stimulated the "builders" with their enthusiasm and innovative ideas when confronted with the technical challenge associated with communications through or receiving data from these satellites.

With Phase-3C, RS-9 and 10 awaiting launch, and with UoSAT-C and Phase-4 on the drawingboard, let us look forward to another 25 years in the Amateur Satellite Service and hope we shall be able to continue the close international co-operation that has been established, and witness the growth of amateur satellites to support an ever wider community reflecting their diverse interests. (de G3YJO).

UOSAT-OSCAR-11 Bulletin-0688 December 27, 1986

AMSAT OSCAR-10

Through the diligent work of a small team of satellite controllers and engineers, additional communications service is now being provided by AO-10. The memory condition continues to deteriorate. Despite this, additional Mode B use may be possible under carefully controlled conditions. QRP use is essential. That means 100 watts ERP

or less please. The satellite is currently experiencing eclipses of approximately one hour duration. Use of AO-10 is therefore limited to MA 21 through 199. Use between 200 and 020 is strongly to be discouraged.

FO-12

JARL and JAMSAT continue to experiment with the new satellite in preparation for its being declared fully operational. Once it is declared operational, it is assumed a regular transponder operating schedule will be established.

RS-5 and RS-7

According to PA0DLO, RS-5 and RS-7 have survived the long eclipse period but have sustained further degradation of their batteries. In particular, RS-5's battery appears incapable of holding a charge. When load on the power supply increases, the voltage quickly drops and the transponder shuts off. The intervention of a ground command station is then required to switch it back on. RS-7 will remain in continuous sunlight between December 6 and January 3. RS-5 will remain in continuous sunlight from December 10 to January 8. Both satellites should be in operation every day except Wednesday UTC. The long rumoured launch of RS-9 and 10 are now put in January 1987.

Thanks to ASR, PA0DLO and ZS6AKV for these reports.

SATELLITE ACTIVITY FOR THE MONTH OF OCTOBER 1986

1. LAUNCHES

The following launching announcements have been received:

INTL NO	SATELLITE	DATE	NATION	PERIOD min	APG km	PRG km	INCL deg
—1986							
074A	Cosmos 1782	Sep 30	USSR	97.8	677	650	82.5
075A	Cosmos 1783	Oct 03	USSR	5hr58m	20045	613	65.8
076A	PRC 19	Oct 06	China				
077A	Cosmos 1784	Oct 06	USSR	89.3	305	203	64.8
078A	Cosmos 1785	Oct 15	USSR	11hr48m	39300	608	62.8
079A	Molniya 3-30	Oct 20	USSR				
080A	Cosmos 1786	Oct 22	USSR	113.3	2589	198	64.9
081A	Cosmos 1787	Oct 22	USSR	89.3	290	215	70.0
082A	Raduga 19	Oct 25	USSR	24hr39m	520	472	63.3
083A	Cosmos 1788	Oct 27	USSR	84.5			
084A	Cosmos 1789	Oct 31	USSR	89.3	316	196	82.6

2. RETURNS

During the period 40 objects decayed including the following satellites:

1986-013A	Cosmos 1731	Oct 03
1986-044A	Cosmos 1773	Oct 21
1986-069A	USA 19	Sep 28
1986-072A	Cosmos 1781	Oct 01
1986-076A	PRC 19	Oct 23

3. NOTES

* Raduga 19 has been placed in a near-stationary circular orbit 36618 km from the surface of the earth. The satellite will be used for communications and television broadcasting.

eti

Electronics Today International February

eti

FEATURES

What weather patterns have in store for us — and what we have in store for them!

Perth — that home of the Americas Cup might seem totally concerned with sailing, but it's also the home of some pretty aggressive businessmen. We take a look at what portends for the electronics industry.

Fed up with the winter SW fare? Arthur Cushen lists all the summer shortwave broadcasts to crackle away the hours.

We review the latest Technics SB-RX50 speakers which audio reviewers have been falling over themselves to get at.

BUILD

○ A 16-bit computer

○ A remotely-controlled speaker switch

○ A Commodore 64 talker

○ A pair of high-fidelity Scan audio speakers

PLUS results of ETI-schools competition ★ more features ★ reviews ★ news ★ engineering tips and latest developments ★ radio news.



HIGH-TECH MONITOR OTC RACE

A state-of-the-art communications system has been developed by OTC. Australia's international communications carrier, to monitor yachts competing in the OTC Southern Ocean Yachting Classic, the longest blue water yacht race ever held in Australian waters.

Employing the latest technologies in radio, electronic messaging and computer analysis, this sophisticated system monitored and reported on yachts during the three race legs from Hobart to Fremantle.

All race contestants report their positions twice daily by radio-telephone to *Merindah Pearl*, the radio-relay vessel that follows the fleet. OTC radio operators on board transmit these reports to the Race Control Centre at the Royal South Australian Yacht Squadron (RSAYS), in Adelaide.

Merindah Pearl is fitted with both "Seatech", radio-telex, and INMARSAT, the international maritime satellite, which allows instantaneous communications between ship and shore. OTC operators in Hobart, Melbourne, Adelaide, Esperance and Perth monitor the schedules and provide backup communications services when necessary.

At the RSAYS, race officials verify position reports and input data into a microcomputer. This computer performs a number of functions such as estimating arrival times of yachts, as well as calculating corrected positions of each yacht by class, handicap and off-the-stick.

The computer also calculates the overall positions of each yacht based upon the results of the last leg.

Having made these calculations, the computer then automatically establishes a telephone connection, via Auspac, to OTC's Electronic Mail system in Sydney and delivers the results to a mailbox.

Simultaneously, the current race positions are displayed at the Control Centre on a colour video screen which simulates the section of the coastline where the fleet is located.

This display lists the 'off-the-stick' and corrects the positions of each yacht in turn so that the entire fleet is described over a 10-15 minute period.

The OTC Southern Ocean Yachting Classic began last month and will finish in Perth days before the America's Cup.

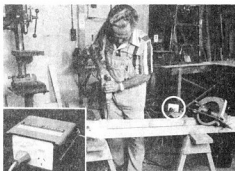
'SAFEGUARD' AGAINST ELECTROCUTION

Every tradesman, hobbyist, do-it-yourself enthusiast and engineer has, at some time, felt the jolt of the electrical mains. All accept electricity as part of everyday living, yet rarely respect it — it is a killer.

Today, all homes have portable appliances, but less than one percent have protection against accidental faults that can so easily occur when the appliance is damaged or misused.

The portable Sanelec Safeguard, is designed to protect the person using portable appliances such as electric drills, polishers, sanders, saws, hair dryers, etc.

It is technically described as a core-balance earth leakage circuit breaker. This means that if there is any leakage of electricity to earth, created by a fault in the appliance, the breaker will trip and provide protection against electrocution.



The portable Sanelec Safeguard is available in two 10 or 15 amp outlets, is quite small in size and designed in a rugged polycarbonate case that can withstand many severe knocks and bumps.

Further details may be obtained from Sanelec Division of Utilux Pty Ltd, 14 Commercial Road, Kingsgrove, NSW, 2208. Telephone (02) 50 0155.

THE MAN BEHIND ATN ANTENNAS

World-renowned moon-bounce pioneer, Ray Naughton VK3ATN, first became interested in electronics in 1935 at the age of eight, when he visited a radio amateur's shack. Ray kept up the interest through his teenage years and in 1943, when accepted for an engineering course at Melbourne University, had further exposure to amateur radio.

In May 1950, he gained his licence and almost immediately began experimenting with antennas. Contesting saw him in the winners circle, including top scorer in the Remembrance Day Contest. VK3ATN gained the DXCC, WAC, WBE and WAZ, while operating from Melbourne's western suburbs.

In the summer of 1951, he moved to Birchip, in north-west Victoria, for three months work experience with Clyde Case (VK3ACE SK), who had an electrical retail business. He then learned he had missed out on a couple of second year engineering subjects and was faced with the prospect of repeating the whole year.

Not being in a financial position to do that, Ray decided to remain in Birchip. In November 1952, Ray failed in his electrical service experience, he started an electrical business called *Birchip Sun Radio*.

The Naughton retailing empire grew to include shops in the main street of Birchip and the neighbouring towns of Sealake and Ouyen.

Ray states it took him until 1977 to accept that there was no money in retailing due to price-cutting and the weather-dependent fluctuating rural economy. He had been successfully making 16-element phased array television antennas and decided to concentrate on manufacturing.

The ATN Antennas company began in 1978, manufacturing HF, VHF and UHF antennas for commercial, amateur and CB radio.

Ray's personal achievements with antennas include:

- the first southern hemisphere-northern hemisphere two-way moon bounce contact with K2HWA/2 (main operator Dick Turin W2HML), the Crawford Hill VHF Group, November 1966
- international recognition for EME work when he became the only non-American to receive the ARRL's Technical Merit Award, November 1967
- construction of a 28 foot (8m) dish to receive signals from the Apollo 11 mission Lunar and Command modules, July 1969
- setting a world moon bounce record using a 16 foot (4m) dish to successfully conduct a 1296 MHz receiving test with W2NFA, Crawford Hill VHF Group, February 1973

The call sign, VK3ATN, will again be bounced off the moon — using six-metres and upwards, hopefully later this year.

Ray said the project will enable Australian radio amateurs to become involved with EME by using decent gain Yagi beams as available from the ATN range of antennas.

ANTENNAS, TOWERS & RADIO ASTRONOMY KITS

In the last nine years, ATN Antennas have exported their products to 17 countries, including Japan and the United States, have been used on Heard Island and in the Antarctic, and were in demand in the Pacific Islands, New Guinea and New Zealand.

The exports were mainly log periodic HF antennas. A recent order was delivered to the Philippines Government for use at approximately nine of its embassies throughout the world. In Canberra, the embassy had a log periodic covering 11.5 MHz to 28 MHz for radio liaison back to Manila.

A large percentage of the 350 log periodics, which have been sold so far, were bought by radio amateurs. These antennas come in six and eight element models, covering 13 to 30 MHz continuously with a claimed VSWR of less than 1.5:1 — and two new models for 10 to 30 MHz and 7 to 30 MHz will be released this year.

ATN log periodics were supplied with a 2 kW PEP balun. Many modern amateur transceivers include a general coverage receiver — a log periodic is ideal for listening over the HF spectrum!

Ray Naughton has written testimonials from radio amateurs in praise of the very versatile antennas, and a report from a happy customer that with an antenna coupler, the log periodic also works on 160, 80, 40 and six metres.

(The company stresses that the antenna has none of the bandwidth problems experienced with trapped beams).

"Why should people buy Japanese and American antennas if we can produce a quality product at about 60 percent of the price, and create local employment," Ray said.

ATN Antennas was growing heavily into the export of its products, including a new aluminium tower, to take advantage of the low exchange rate for the Australian dollar. Its range of VHF and UHF antennas are also very popular — ATN's 14 element beam for amateur television is in wide-spread use.

Featured on the cover of the 1986/87 *WIA Australian Radio Amateur Call Book* were 16 days of 16 element ATN beams. "The quality of the product is there — we use the best available materials — and the latest technology with help from a world leading antenna designer.

"They are all optimised — you cannot get any more gain on that given length boom." Ray said, commenting about the VHF and UHF antennas. The product range reflected the latest technology and was aimed at the Australian radio amateur.

This year, ATN Antennas will make beams for 7 and 3.5 MHz — and is willing to make any specialised antenna for hobby communications or commercial use.

The company hope to have radio astronomy educational kit available late this year, for schools and other educational institutions.

The latest thrust for ATN Antennas is the manufacturing of a bolt, top-hat, gate, triangular aluminium tower. They come in 5.5 metre sections and are supplied with tools to put them together. The sections can be shipped anywhere in Australia for an additional \$20, which includes insurance.

In one application for the tower, you bolt together two or more sections. Using a Hazer framework, which fits neatly around the tower, you mount the rotator, bearing and antenna while it sits just above ground level. The boom of the antenna could be about two metres off the ground and reached with a step-ladder.

With the aid of a winch, the Hazer is hauled up to the top of the tower — there are in-built safety features to prevent the Hazer from crashing down.

The ATN Antennas product, believed to be the only triangular aluminium tower made in Australia, also comes in a tilt-over version. Complete engineering standards and computations are available and the hardware supplied is stainless steel.

Ray said: "The features of this tower are so enormous — that is why interest has already been shown from governments for use on Pacific Islands."

The tower sections could also be used by an

experimenter as antenna booms for 7 or 3.5 MHz beams.

Inquiries about ATN Antennas' products should be directed to the company at PO Box 80, Birchip, Vic. 3485 or telephone (054) 92 2224.

—Contributed by Jim Linton VK3PC

BROAD FIELDS

The Australian Maritime College, located in Launceston, is not only restricted to electronic courses.

The college caters for numerous maritime oriented courses, covering all facets of the profession, from short courses in revalidation of certificates to maritime engineering degrees, including a special Hydrographic Surveying Course. The college is believed to be only one of three non-governmental institutions in the world to offer this accredited course and interest has already been shown in Britain, the USA, and many other countries.

The staff are conscious of the advancement in technology and are updating the facilities available, as well as gaining first hand knowledge by being on board seeing some of the problems involved, in vessels entering Antarctic waters to those of patrol boats in the Pacific.

For those interested, further information may be obtained by writing to: Australian Maritime College, PO Box 986, Launceston, Tas. 7250.

NEW OUTLETS

Dow-Key Microwave, manufacturers of microwave switches and RF coaxial relays, have appointed Elmaseco Instruments Pty Ltd as exclusive agents of their products in Australia.

All inquiries should be directed to Elmaseco State Offices or their distributors.

Integrated Power Semiconductors, based in Scotland and specialising in power supply control, voltage regulators and similar type ICs have appointed Tronic Bits, 14077 Hightest Road, Hightest, Vic. 3190, as their Australian representatives. Contact Tronic Bits for further information.

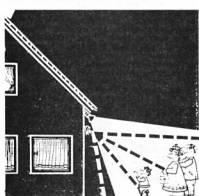
Hewlett Packard has opened a \$5 million, 3700 square-metre sales facility in Canberra's Fern Hill Technology Park.

Skandia Electronics, the Melbourne based importer and distributor of a multitude of companies engaged in all phases of electronics, has expanded its operations by opening a New South Wales office located at 199 Parramatta Road, Flemington.

AUTOMATIC LIGHTING CONTROL

There are many passive infra-red devices in use for intrusion alarm systems, but few that can be used for directly switching lighting.

Utlux has recently introduced Scanelite which is suitable for both indoor and outdoor use and is capable of switching up to 2 kW (resistive) loads. The detection unit is small, about 75 mm square and has a range up to approximately 15 metres.



It functions by the detection of heat and movement. If a person moves into the detection zone, then the unit will operate and switch on the selected lights. After a preselected time (adjustable between 12 seconds and 12 minutes) providing no movement has been detected, the Scanelite switches off the lights automatically. An inbuilt photo cell is provided that can be adjusted to allow daylight walk tests or provide operation only at night.

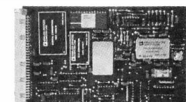
This unit is just not for detecting intruders, it can also be used to welcome your guests with automatic pathway lighting, or to light your driveway when you arrive home late.

Scanelite is available through your local electrical wholesaler. Full information is available by contacting your State Utlux Office or direct from the Scanelite Division of Utlux Pty Ltd, 14 Commercial Road, Kingsgrove, NSW. 2208.

THROUGHPUT ON A SINGLE-WIDTH EUROCARD BOARD

A new 12-bit analogue-to-digital converter has been introduced by Analog Devices Inc. The CAV-1205 features 5 MHz throughput and is designed on a small, single-width Eurocard board that includes a track-to-hold, an encoder section, output registers, and all of the necessary timing circuits to generate 12 bits of digital output data.

Applications for the CAV-1205 include radar systems, medical instruments, transient analysis and designs where high resolution, high speed and small size are required.



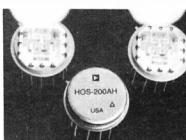
It specifies minimum in-band harmonics, generated at a 5 MHz encode rate, of 70 dB below full scale with a DC to 500 kHz input, and 62 dB below full scale with a 500 kHz to 2.5 MHz input. Minimum signal-to-noise ratio at 540 kHz input is 65 dB, and 62 dB at 2.5 MHz input frequency. With full-scale analogue input ranges of ± 1.024 or ± 0.048 , the converter is guaranteed monotonic over temperature, 0 to +70° Celsius.

For further information contact Parameters Pty Ltd, Box 261, North Ryde, NSW. 2113 or Private Bag No 1, Oakleigh South, Vic. 3167.

BUFFER AMPLIFIER

A new hybrid buffer amplifier provides up to ± 100 mA of continuous current drive, ± 250 mA peak, at frequencies to 200 MHz. The HOS-200 is a high-speed buffer amplifier featuring a 1500 V/us slew rate, capability to drive 50 and 75 ohms cables, and operation with ± 5 V power supplies compared to ± 15 V supplies for competitive parts.

Applications for the HOS-200 include instrumentation, coaxial cable driving, high-speed line driving, A/D input buffering, and current boosting.



Low-voltage power requirements make the buffer well-suited for remote or portable equipment where low supply voltages are used, or for primarily digital systems where +5V (TTL) and -5.2V (ECL) power is available.

Additional key AC specifications include phase linearity of two degrees (at a bandwidth from 1 to 20 MHz) and distortion of less than 0.1 percent, key parameters for raster graphics and video speed applications. Propagation delay and rise time are both typically 1.5 ns. DC specifications guarantee a minimum power supply rejection ratio (PSRR) of 40 dB and minimum output voltage swing of 4.0V.

Two grades of the HOS-200 are available, AH and SH, which guarantee operation over -25 to +85° Celsius and -55 to +125° Celsius temperature ranges, respectively. Maximum power dissipation is only 160 mW.

For further information contact Parameters Pty Ltd, Box 261, North Ryde, NSW. 2113 or Private Bag No 1, Oakleigh South, Vic. 3167.

GOOD NEWS FOR ICOM USERS

In this era of rapidly expanding technology and ever-increasing pressures on the radio spectrum, it's reassuring to know that one communications equipment manufacturer is taking positive steps to counter the trend toward "planned obsolescence" seen in so many modern consumer products.

In the Amateur Radio Service, one of the ever present problems for transceiver manufacturers is the different band segments allocated for amateur radio operation in different parts of the world.

There is also an increasing threat, in many countries, of major alterations to amateur allocations due to the changing needs of commercial and government spectrum users, and of the Amateur Radio Service itself.

Sometimes this results in extra allocations for radio amateurs; at other times it may mean significant changes in the upper and lower frequency limits of amateur allocations on various bands, particularly in the VHF and UHF regions.

Evidence of this trend toward spectrum restructuring has been seen recently in the United States and Canada where radio amateurs using the 70 centimetre band in the border regions between the two countries have been forced to seriously curtail their use of this allocation.

Amateurs in other parts of the world are, or may soon be, facing similar problems.

If an amateur allocation is significantly changed, some radio amateurs may be left with expensive transceivers which no longer provide coverage of the full amateur allocation.

If, for example, the "Two Metre" amateur band was "relocated" to 150-154 MHz to make way for a special purpose television system, many transceivers could not be easily modified for the new allocation.

Icom equipment buyers, however, can rest easy in the knowledge that all 'new generation' Icom base station transceivers and receivers have been designed to sidestep 'operating range obsolescence'.

To achieve the flexibility needed to ensure continued compliance with amateur allocations in the future, broadband RF circuits and full microprocessor-controlled tuning systems are now employed in all new Icom base station transceivers and receivers.

But Icom hasn't stopped there. The Icom engineering team has gone one step further in its development of 'third generation' PLL/VFO technology.

Most amateurs would know that Icom has achieved an unequalled reputation for frequency accuracy and stability in receiver and transceiver design.

So it should come as no surprise that Icom is also leading the way in the design of 'flexible' transceivers and receivers.

By clever use of the memory capacity inside the CPU (central processor unit) and the addition of external RAM (random access memory), Icom is now able to offer an 'update' service that ensures the future useability of these new generation Icom products.

Icom's frequency-controlling RAM is contained on a single plug-in PC board mounted near the CPU, which also houses a lithium cell designed to retain all the information stored in RAM even when no power is provided to the transceiver.

In the event that an amateur radio allocation is changed so that the transceiver no longer covers the required frequency allocation, the RAM board alone can be removed from the transceiver and returned to Icom's Australian head office in Melbourne for re-programming.

It is not necessary to return the complete transceiver. Cheap, convenient and simple!

This is only one example of Icom's commitment to provide the best possible customer service and to ensure that your Icom transceiver or receiver is the best that money can buy.

For those interested in experimenting, Icom Australia can also provide the original programming data stored in the RAM for use in a computer program to customise your Icom transceiver or receiver by computer control.

Because the lithium cell on the RAM board is essential to maintain the RAM data — the 'identity' of each unit — Icom has conducted extensive tests before selecting a lithium cell suitable for this purpose.

As lithium cells have only been manufactured in the last 10 years, real time performance is impossible to prove. In choosing the appropriate cell, Icom has intentionally 'over-designed' its cell specification to ensure reliability.

The Icom lithium cell is rated at 165 milliamperes/hour capacity. In normal use, the cell is designed to retain at least 91 percent of this capacity after 10 years of use.

During pre-assembly tests at the Icom factory, each RAM board is placed in a special test jig where the total drain current is measured before the board is installed in the transceiver or receiver.

Measured current demands must not exceed 100 nanoamps (.0001 milliamps), so the minimum life of the lithium cell is not 10 years, but 180 years.

As if this is not enough, actual current values measured for Icom memory applications are normally between 10 and 30 nanoamps, yielding a cell life calculated to be 600 years.

Lithium cells of this type are installed on the RAM boards of the IC-0751A and IC-745 HF transceivers, the IC-271A VHF transceiver, IC-471A UHF transceiver, the IC-1271A 1.2 GHz transceiver, the IC-R71A HF general coverage receiver, and the IC-R7000 VHF/UHF general coverage receiver.

In choosing to buy an Icom receiver or transceiver like those listed above, you might say that you are making a 'lifetime investment' in a rig designed to meet what ever tomorrow might bring.

For further information, contact Kyoshi Fukushima or Duncan Baxter at Icom Australia on (03) 51 2284.

STATE-OF-THE-ART ANTENNA TUNER

One of the most frustrating aspects of mobile HF amateur operation, especially where more than one band is used, is the time-consuming and often inconvenient need to change antennas or retune every time you change bands. Below 40 metres, it's often necessary to re-tune every time you change frequency more than a few kilohertz.

The end of this frustration is now in sight with the release of Icom's sophisticated AH-2 Automatic Antenna Tuner.

This digital-microprocessor controlled automatic mobile antenna tuner is designed for use with the Icom IC-735 HF mobile transceiver on all HF bands from 80 to 10 metres, including WARC bands, using only the supplied AH-2 short stainless steel whip antenna. It can even operate on 160 metres with the addition of an extension whip antenna.

The brain behind the AH2 is an 8-bit microprocessor circuit inside the AH2a Controller Unit which obtains an optimum match from more than 260 000 possible LC combinations... and all in usually less than six seconds between 80 and 10 metres. Up to eight pre-programmed LC combinations can be stored by the Controller Unit for favourite frequencies, with recall and tuning usually in less than one second.

The compact AH2a controller attaches neatly to the side of the IC-735 transceiver and is operated by simply pressing the 'TUNE' button. Band data is obtained directly from the 'ACC 2' connector on the rear of the IC-735.

The rugged AH2b bumper-mount whip supplied with the AH2a controller is only 271 mm long, yet it will present an SWR at the transmitter of less than 1.5:1 between 3.5 and 30 MHz.

The AH2a Tuner Unit, the third part of this combination tuner, is designed to be mounted in a convenient location away from the transceiver, usually in the boot of your car, in its own sturdy, weather-resistant case.

The AH2 Automatic Antenna Tuner can also be used with existing whip antennas or in other applications such as marine and limited space situations.

For more information on the AH-2 Automatic Antenna Tuner, contact your nearest authorised Icom dealer or Icom Australia on (03) 529 7582.

MAKE THE MOVE TO 1296 MHz

The engineering department of Icom Japan has a valued reputation for being responsive to the needs of the radio amateur. As interest in the 1296 MHz band has grown — so has Icom's research and development into transceiver design for this "new frontier" of amateur experimentation. Icom can now offer the serious 1296 MHz user a serious 1296 MHz multi-mode base station transceiver.

The Icom IC-1271A was designed in response to the needs of amateurs world-wide who have expanded 1296 MHz usage, taking in satellite and amateur television operation as well as mode and antenna experimentation.

The IC-1271A is to 23 centimetres what the IC-271A is to two metres — the reference transceiver by which all other transceivers will be measured.

1296 MHz is an exciting new band and the IC-1271A is an exciting transceiver designed to make the most of what 1296 MHz has to offer.

Its features include FM, SSB and CW operation, dual VFOs, 32 fully programmable memory channels (each of which can be used as a separate VFO), storing frequency, mode and offset, variable frequency stepping down to 100 Hz per step, full scanning facilities and Icom's unique RAM-equipped flexible central microprocessor which

allows for computer control and makes provision for any future alterations to frequency allocations in this band.

Exceptional receiver sensitivity has been achieved through use of state-of-the-art GaAsFET front end design. SSB and CW sensitivity is claimed at less than 0.16 microvolts for 10dB S+N/N. FM sensitivity is claimed at 0.22 microvolts for 12dB SINAD or 0.32 microvolts for 20 dB of noise quiescent.

Superb receiver selectivity, achieved through the use of Icom-engineered internal filters, means more than 2.4 kHz SSB/CW selectivity at -6 dB (less than 4.8 kHz at -60 dB) and FM selectivity of more than 15kHz at -60 dB (less than 30 kHz at -20 dB).

Images and spurious signals are minimised by the use of triple conversion superheterodyne circuitry with a variable first IF of 133.8600-133.8699 MHz on SSB/CW (133.680-133.689 MHz on FM), a second IF at 10.750 MHz and a third IF at 455 kHz (FM only).

Power output from the IC-1271A transmitter PA is continuously variable from one to 10 watts.

Frequency stability is claimed within plus/minus 0.0003 percent (three parts per million) within the operating temperature range of 0-50 degrees Celsius.

For the ATV enthusiast, the IC-1271A can open the way to a very different and more technologically sophisticated ATV system employing the optional TV-1200 ATV Adapter, designed for use with the IC-1271A.

The TV-1200 connects directly to the IC-1271A and outputs video and audio colour signals when used in conjunction with a video camera, video cassette recorder or other TV signal source.

1296 MHz operation may soon be enhanced in many areas of Australia with the release by Icom of its IC-RP1210 1296 MHz repeater system, with 196 DIP-switch controlled channels, high-stability PLL frequency synthesis, CTCSS tone encoding facility, three-digit DTMF function control, 10 watts of FM output and selectable "hang time."

For the 1296 MHz mobile user, the IC-120 mobile transceiver features six memory channels, scanning, sub-audible tone encoding and three frequency stepping rates. Used with the ML-12 optional amplifier, the IC-120 provides 10 watts of FM output. It can also be used in the shack in conjunction with the slim-line PS-45 power supply.

Portable operation on 1296 MHz is also a reality with the release of Icom's IC-12A hand-held transceiver, a 23 centimetre version of the popular IC-02A and IC-04A hand-holds for two metres and 70 centimetres.

Full-feature operation on the 23 centimetre band is now guaranteed.

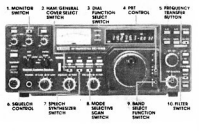
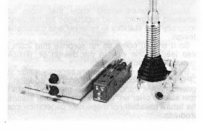
For photos, a review unit or further information, contact Kyoshi Fukushima or Duncan Baxter at Icom Australia on (03) 529 7582.

ICOM IC-751A

Icom's valued reputation as a manufacturer of quality amateur and commercial radio transceivers has been enhanced with the release of the IC-751A HF (high frequency) amateur transceiver.

Designed with the serious amateur operator in mind, the IC-751A is not to be confused with the earlier model IC-750 for the IC-751 Japanese domestic model of the IC-750 which Icom did not import into Australia.

This, the 'flagship' of the Icom HF fleet, features coverage of all authorised amateur bands from 1.8 to 29.7 MHz plus a general coverage receiver with sensitive reception from 100 kHz to 30 MHz continuous.



Thirty-two memory channels store both frequency and mode. The memory capabilities of the IC-751A are enhanced by mode-selective scan, priority memory scan and scan lock-out.

In the receiver department, contesters and serious DXers will appreciate the improved noise-blanker circuitry with variable pulse level and width, the new AGC (automatic gain control) circuitry, an improved speech compression circuit for significantly better audio output quality, and a receiver dynamic range of 105 dB.

Receiver specifications include sensitivity figures of 0.15 microvolts for 10 dB S/N (1.6-30 MHz, SSB/CW/RTTY, preamp on), selectivity of 2.3 kHz at the -6 dB points (SSB/CW/RTTY), image rejection of better than 80 dB, and notch filter attenuation of more than 45 dB on interfering carriers.

The state-of-the-art receiver is a quadruple-conversion superheterodyne circuit using four intermediate frequencies (all modes except FM) at 70.4515 MHz, around 9.01 MHz, 455 kHz and around 9.01 MHz again.

CW enthusiasts will appreciate the in-built electronic keying circuit — plug in a paddle key and away you go — which is QSK rated at up to 40 words per minute. The standard 500 Hz CW filter (FL-32A) and variable-level CW sidetone control, which operates in both receive and transmit modes, will also be popular features of this new transceiver.

CW performance can be improved even further with the addition of the optional FL-52A (455 kHz at 500 Hz) filter, FL-53A (455 kHz at 250 Hz) narrow filter or the FL-63A (9.0106 MHz at 250 Hz) narrow filter.

General receiver performance is enhanced by the inclusion of variable pass-band tuning (PBT), a deep notch filter (45 dB), variable pulse-type noise blanker, 9.9 kHz XIT/RT and a large, clear, multi-function meter.

A sophisticated thermal sensor in the IC-751A transmitter circuit continuously monitors the internal temperature of the transceiver and automatically controls the in-built cooling fan to ensure maximum output and frequency stability, especially during continuous operation (RTTY, contesting, etc) of the 100 percent duty cycle transceiver.

Options available for the IC-751A include a 2.8 kHz SSB filter (FL-70), 6 kHz AM filter (FL-33), IC-PS30 external power supply, IC-AT500 automatic antenna tuner, C-EX300 microprocessor interface connector, IC-10 remote controller, IC-SM8 or SM10 desk microphones, IC-2KL solid state linear amplifier, IC-SP3 or SP7 external speakers, CR-64 high stability 30.72 MHz reference crystal and the C-EX310 voice synthesiser.

For the serious amateur, inspection of the Icom IC-751A is a must. Now you can truly ask yourself "Can I handle this much transceiver?"

CHEAP CHARGERS MAY BE DANGEROUS

The appearance of cheap "pirated" copies of the Icom BC-35 AC Battery Charger is cause for serious concern. Icom Australia director Kyoshi Fukushima said recently. Mr Fukushima warned that the illegally copied chargers, while almost identical in exterior design to the genuine unit,

have not been certified safe by Australian electricity authorities and may cause serious, even fatal, injury to unsuspecting users.

Designed for use with the IC-BP3 Battery Pack, the BC-35 and BC-36 Battery Chargers are a common accessory for many Icom VHF and UHF hand-held transceivers.

"The power transformer in the genuine BC-35 is approved by the State Electricity Commission of Victoria," Mr Fukushima said, "but the transformer in the copy has not been SEC approved and appears unsafe for use with Australia's 240 volt mains power supply."

"The copy is hard to identify so most users would believe they had bought the genuine Icom product. The similarity is obviously intended to deceive intending buyers of the genuine product. In fact it was only when aware of the problem."

"The circuit board, power transformer and other components are not of the standard used in the genuine BC-35. Icom's charger is designed for safety and reliability. It uses a high quality double-insulated power transformer for complete mains power isolation. The copy uses only a thin layer of plastic insulation between the primary and secondary windings of the transformer."

"It is not only unsafe and unreliable, it could also cause considerable damage to the BP-3 Battery Pack and the transceiver itself. But what we're most concerned about is the risk of serious injury."

Icom distributes only the BC-36 AC Battery Charger, the export model of the BC-35. Those who have purchased BC-36 chargers from authorised Icom dealers need not be concerned.

BC-35 owners with in-house technical staff can identify the pirated charger by removing the outer cover and inspecting the internal circuit board. The genuine BC-35 circuit board is marked with full component identification and the power transformer is marked "240V" and "24V". The pirated unit has no circuit board or transformer markings. If in doubt, the BC-35 can be taken to the nearest authorised Icom dealer who will be able to confirm if the unit is a genuine Icom product.

For further information, contact Kyoshi Fukushima or Duncan Baxter at Icom Australia, 7 Duke Street, Windsor, Vic 3181, or phone (03) 529 7582.

NEW CROSSED NEEDLE MFJ ANTENNA MATCHER

"One of the world's finest 300 watt antenna tuners with features that only MFJ can offer!" reads the headline in GFS Electronic Imports advertising brochure on their new MFJ-949C crossed needle antenna matcher.

It goes on to say "... dummy load, SWR, forward reflected power meter, antenna switch, balun. Matches everything from 1.8 to 30 MHz." GFS claim that the MFJ-949C Deluxe Versa Tuner II will handle a transceiver with up to 300 watts RF output and match it to any feedline from 1.8 to 30 MHz regardless of whether coaxial cable, balanced line or random wire is used.

The MFJ-949C's crossed needle meter provides a simultaneous reading of forward power, reflected power and SWR in either a 30 or 300 watt range. No SWR sensitivity adjustment is needed so that you have a permanent watchdog on your final transistors.



A built-in 200 watt air cooled dummy load allows you to tune up your transceiver "off-air" minimising annoying interference to others. Dummy load selection is via a flexible six position coaxial switch which also provides access to either of two coaxial lines directly or via the tuner, as well as a random or balanced line.

At the heart of the MFJ-949C is a large efficient 75 mm diameter airwound inductor which pro-

vides more matching range and less loss for more watts out.

Its many other outstanding features include a built-in 4:1 balun, 1000 volt rated capacitors, SO-239 coaxial connectors and binding posts for balanced line, random wire and ground. The 949C measures 250 x 175 x 75 mm and is currently priced at \$754 plus \$18 P & P.

If you would like further information contact GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone: (03) 873 3777.

NEW MFJ COAXIAL RF SWITCHES

GFS Electronic Imports, announced recently the release of two new Coaxial RF Switches from MFJ Enterprises.

The first, MFJ-1701, is a six position switch which allows switching between six antennas without the need to unplug cables. It can be used on both 52 and 75 ohm systems. It will also handle 2000 watts SSB or 1000 watts CW. The MFJ-1701 is fitted with seven SO-239 connectors and exhibits negligible insertion loss on HF bands.



All unused inputs are automatically grounded for static, lightning and RF protection. Equipped with convenient mounting holes for desk or wall mounting it measures approximately 250 x 75 x 38 mm and is priced at \$154 plus \$12 P & P.

The second switch is the Model MFJ-1702, a two position switch designed for 50 ohm systems. It is capable of handling 2.5 kilowatts PEP and has an insertion loss of less than 0.2 dB. Isolation is better than 60 dB at 300 MHz and 50 dB at 450 MHz. VSWR is less than 1.2:1 plus the unused terminal is grounded for static, lightning and RF protection. The MFJ-1702 measures just 75 x 50 x 50 mm and is priced at \$99 plus \$10 P & P.

For more information contact: GFS Electronic Imports, 17 McKeon Road, Mitcham, Vic. 3132. Phone (03) 873 3777.



SECURITY CONSCIOUS

More organisations are becoming security conscious of who has access to privileged information as keys, access codes, and magnetic impregnated cards can be defeated by thought and careless handling, generally unknown to the entrusted employee or, more importantly, their employer.

Recently released in Australia, by Access Control Systems, is the US system EyeDentity which revolutionises security management.

EyeDentity works on the principle that every person, even identical twins, have distinct, yet stable, retinal patterns that vary only under conditions of serious eye diseases.

The unit uses a low intensity infra-red light source, circularly scanning 320 readings of the intricate patterns at the back of the eye. All is accomplished, including releasing the locking system, within seven seconds and it is also claimed it has a capacity to hold information on 1200 "eye signatures."

Another method of defeating access to the unauthorised is the use of fibre optics instead of copper transmission cables. Though not foolproof, it is more time consuming and not as easy to access, due to its construction.

Club Corner

TOWNSVILLE AMATEUR RADIO CLUB

Advance notice is given that, the Townsville Amateur Radio Club will be holding the eighth Biennial North Queensland Convention over the weekend of Friday, September 4, to Sunday, September 6, 1987.

The venue is, once again, the beautiful setting of the Western Campus of the James Cook University.

On-site accommodation will be available.

Further details from the Convention Secretary, TARC, PO Box 964, Townsville, Qld. 4810, or telephone Bob Mann VK4WJ, on (077) 81 4450 BH or (077) 79 7869 AH.

TOWNSVILLE AMATEUR RADIO CLUB

The recent Annual General Meeting of the Townsville Amateur Radio Club saw a total of 33 positions filled for the coming year. This was an incredible result, and indicates the continuing support for the Club. It is worthy of note that the incoming President is Evelyn Bahr VK4EQ, who is the first female President. She is also one of the Life Members of the Club.

New office bearers for 1987 were elected as follows:

President
Vice-Presidents
Secretary
Treasurer
Publicity Officer
Class Manager
Co-Editors

Librarian
Co-Station Managers

WICEN (Region 1A)
WICEN (Deputy)
WICEN (TARC)
Intruder Watch

Slow Morse Co-Ord
Slow Morse Ops

Auditor
QSL/Awards
Disposals Officer
Activities Officer
Trustees

The outgoing President, Harry Vermer VK4BBC, then read the President's Report.

—Contributed by Peter Ranton VK4PV, Publicity Officer

WESTERN RADIO CLUB

In October 1958, Les Mitchell, whose amateur radio call sign was G3BHK in England, founded the concept of amateur radio operators making their radio shack equipment available to members of the scouting association, with the idea of allowing scouts to get-together on-the-air and speak with one another. This way, they could exchange ideas and, of course, it would introduce the scouts of all ages to amateur radio with all its thrills and mysteries, which perhaps up to this time, had only been known to the "radio weirdo" up the road. In keeping with scouting language, this yearly get-together became known as a Jamboree — in particular, Jamboree on the Air.



Waldis VK2DXV, assisted with the JOTA station at Blackheath.

Since 1958, two days of each year, the third full weekend in October, have been set aside for JOTA by both organisations.

Girl Guides also join in the activities and provide a very solid backing and lively aspect to the whole operation.

In 1985, scout stations operated from 103 different countries, with an estimated excess of 8000 stations operating.

The Western Radio Club members have been involved with JOTA since October 1984.

The Western Radio Club was founded in June 1982 by a group of radio enthusiasts in the western region of Sydney. The interests of club members range from amateur and CB radio to shortwave listening and utility scanning. Many members have special interests such as personal computers, RTTY, DX home-brewing, VHF/UHF communications and antenna design and construction. The real difference with this club is that it does not align itself with any particular aspect of radio.

Helping to run the JOTA station in 1985, with the Tootle District Scouts, was more fun than the proverbial barrel of monkeys. As it was such a success a meeting was called and plenty of planning of events was organised for JOTA 1986. It was suggested to Steve Shaw, the Scout Leader for 1st Westmead, that as 1986 was the International Year of Peace, the club could incorporate the theme into JOTA — and idea which Steve agreed to.

A suggestion was also made that the Scouts and Guides from the Tootle District participating in JOTA be given the opportunity to pass their Communications Badge over the weekend. Also, as well as speaking on the radio, the Guides and Scouts could build various kits under supervision and a simple question and answer examination was formulated with multiple choice answers.



Andy Keir, has an attentive audience as he operates satellite equipment.

When the equipment was set up at Blackheath there was no shortage of Scouts and Guides at the microphone. A favourite contact for the Scouts was the half hour spent talking with 3D2ST, in Fiji, and exchanging information and badge details with the 1st Suva Troop.

On Saturday afternoon, contact was made with Murray ZL3TJM, via JAS 1. Other stations contacted were RASJF, YBOS, JAGHUQ and UW0CT.



Western Radio Club member, Colin Thompson, shows some Scouts the finer points of kit-building.



Warren Upton enjoyed JOTA weekend.

Sunday saw the Scouts receive their Communications Badges, and the Scout whom the leaders felt had put in the most effort was presented with a kit.

The weekend was a great success with over 400 Scouts, Girl Guides and Cubs attending the Blackheath JOTA station, and who knows, maybe a few budding amateurs of the future may have participated in JOTA 86. At the conclusion of the weekend the club was presented with a Certificate of Appreciation by the District Commissioner, which was a welcome surprise.

Attendances are really looking up for the club with 22 attending the recent meeting to hear guest speaker, Peter VK7PF, from the Northern Branch.

Repeater 3 has been misbehaving lately (a fault has developed in it), by sending spurious noise when operators are transmitting. The RAD control unit has been improved and a one second pause is required to reset the repeater between overs.

It is easy to see that the bands have begun to improve as there were 196 incoming QSL cards.

The Radio Room is still progressing well and donations are still being received, for which we thank the donors. Frank VK7ZF, gave a black and white television set, two pieces of test equipment and some rolls of RTTY paper whilst John VK7KDR, gave a two metre high rack on castors to house some of the equipment.

The Club sadly farewells Frank VK7ZF, and thanks him for all the work and time he has put into the Club as News Officer. Frank has moved to VK1.

One of the repeaters on Mount Duncan recently had a very close shave when a large tree fell barely missing the cable and guy wires. Fortunately, only the wires suffered slight strain.

The Clanger Award for the month was presented to John VK7KDR, for using the hand-held rig with an insulator on the battery pack, and for his donations to the club rooms.

Guest Speaker, Peter, explained where membership fees, recently increased to \$35, go to. A lively discussion followed on pensioner concessions. Peter also discussed State Council

Policies and some policies are to be printed and given to each branch for easy reference by members. Peter then gave a talk on satellites and his trip around the world in 1984, illustrated with slides.

The Branch AGM, which was to be held in December, will now take place in February.

—Contributed by Max VK7KY and Greg VK7ZBT

SOUTHERN AMATEUR TELEVISION GROUP

A 23 cm repeater has been approved for the southern districts of Adelaide.

The 23 cm ATV repeater, with the call sign VK5RWH, is situated at Willunga Hill.

The repeater licence was applied for in November 1985, and granted in June 1986. The Southern Amateur Television Group was formed in late 1985 to investigate the possibility of a repeater to cover the area south of O'Halloran Hill, where VK5RTV is located.

Although VK5RTV is received well in a northerly direction, this is not the case in the southern viewing area, due to the geography of the location. Most viewers and transmitting members found it necessary to spend a considerable amount of money on antennas and preamplifiers in an attempt to receive a marginal picture.

The group were offered a site on Willunga Hill, which will service the southern area well.

At the end of last year, the transmitter and receiver were operational and the control circuitry, ident, etc were well under way.

Technical details of VK5RWH are as follows: Uplink Vision 444.250 MHz, Sound 449.750 MHz; Downlink Vision 1246.250 MHz, Sound 1251.250 MHz; Transmitting Antenna is an Alford Slot; Receiving a Collinear; Power Output — one watt average, to be increased later as funds permit. The transmitter consists of a TGL commercial modulator unit with an output at 851.250 MHz to a HP diode mixer. Oscillator chain injection frequency is 395 MHz to give an output of 1246.250 MHz. This is fed into six linear stages with an FM571 transistor in the output.

Chairman: Brian VK5KEU
Secretary/Treasurer: Mike VK5KMM
Co-ordinator: Nick VK5NT

Technical Officers: Ray VK5ZEF and Lee VK5NK
Control circuitry: Ray VK5ZEF, Barry VK5KAU and Neville VK5ZHP

Barry VK5KAU was actively engaged in the work on VK5RCN repeater in the mid-north, and this is proving very helpful to the VK5RWH project.

This is believed to be the first 23 cm ATV repeater in Australia and the group are looking forward to great things in the future.

The group would like to thank the ATV Group for donations to this project and the WIA SA Division for their help.

A new FM 23 cm repeater, VK5ROH, has been approved, but that is another story.

—Contributed by Brian Usher VK5KEU

NORTH-EAST RADIO GROUP

The North-East Radio Group will be conducting the 2nd Victorian Fox Hunting Championships on Saturday, February 28, 1987. It promises to be a busy, but enjoyable day for all participants.

Prizes will be awarded to the first three placemen of each event. A perpetual trophy has been donated on which the overall winners call sign and/or name of the club will be engraved.

If you are missing equipment for any of the bands, NERG may be able to assist. Provided you can receive on the band of interest, the only other equipment needed is a directional antenna and step attenuator. For the cost of an SASE, NERG can provide photocopies of articles/information sheets for any of the following:

ESTIMATED COST TO BUILD

10m Loop	\$5
80m Farite Rod	\$3
2m Beam	\$6
70 cm Beam	\$6
Step Attenuator	\$6

If you are really in trouble, both for time and equipment, several spare sets of DF antennas are

available for loan ... contact the undersigned before the event.

The event will be fully catered in the usual NERG tradition. A barbecue lunch, refreshments and an evening meal will be provided for at an estimated cost of approximately \$8 per head.

Program

TIME — EVENT

0900 — Registration and gear setup. Test signals available.

1000 — 2m Fox Hunt.

1100 — 70 cm Fox Hunt.

1145 — Sniffer Hunt.

1230 — BBQ Lunch.

1330 — 10 m Fox Hunt.

1410 — 80 m Fox Hunt.

1450 — Three-leg Fox Hunt.

1600 — Multi-leg Sniffer Hunt.

1630 — Talk-in Hunt.

1710 — Traditional NERG Fox-Hunting Supper.

Further inquiries to Geoff Hudson VK3CGH, 16 Fowler Street, Box Hill South, Vic. 3128, telephone (03) 288 6019 AH.

FRANKSTON & MORNINGTON PENINSULA AMATEUR RADIO CLUB INC

Last year was another successful year for FAMPARC, and it is hoped that this trend continues throughout 1987.

At the Club's Annual General Meeting on Friday, December 12, the following were elected for the 1987 committee:

President	Earl Russell VK3BER
Vice-President	Philip Pavay VK3BHN
Treasurer	Robin Brading VK3KRB
Secretary	Gordan Buchanan VK3BGB
Assistant Secretary	Jessie Buchanan VK3VAN
Committee Member	Frank Beer VK3DYE
Committee Member	
Social Secretary	Chris Chapman VK3BMG

With three newcomers and some 'younger amateurs' on the committee, 1987 looks like being an interesting year for FAMPARC.

Club events for February include a barbecue on the eighth at 11 am, to be held at the home of VK3VB, 6 Bayview Road, Tororoin. The 10th Anniversary Awards Weekend will be held at Mount Martha culminating in a meal at the Dava (February 28-March 1).

The 1987 Novice Classes begin on February 24, at 7 pm and usual meetings are held on the second and fourth Fridays of each month. The Club meets at the Brotherhood of St Lawrence, Frankston-Dandenong Road, Carrum Downs.

For more information on FAMPARC's activities, write to: the Secretary, PO Box 38, Frankston, Vic. 3199 or call in on the Club Net, Wednesday nights at 2000 local on 3.570 MHz \pm QRM. Listen for the Club Call Sign, VK3BHU.

—Contributed by Philip Pavay VK3BHN, Vice-President FAMPARC

GLADSTONE AMATEUR RADIO CLUB

Awoonga Dam, south-west of Gladstone, was the venue for a tree-ways social meeting between members of the CQ Division of the WIAQ, Rockhampton, the Biloela Amateur Radio Club and the Gladstone Amateur Radio Club, on November 9, 1986. The host club was Gladstone, with the day well organised by the club's Vice-President, Will VK4XP.



Members and their families relax and enjoy the surroundings at Awoonga Dam.



From left: Jeanette VK4BZL, Errol VK4ZHL and Will VK4XP

The day's activities began at 11 am with a taped replay of the WIA News, followed by a barbecue lunch at 12 midday. A treasure hunt for the children was held at 1 pm, a fox-hunt on two and 10 metres was held at 2 pm, and a raft race for the children at 3 pm. Activities ceased at 4 pm.

The fox was pursued with great zest by one and all and the worthy winner was Gordon VK4AGM, representing the CQ Division.



Nigel VK4FPC (Gladstone President) presents the Fox-hunt Award to the winner, Gordan VK4AGM.



From left: Doug VK4ZDK, David Christmas, Lyle VK4ALD, Ivan VK4QO and Don VK4ZFB.

The day provided an excellent opportunity for amateurs in Central Queensland to establish 'eyeball' QSOs, meet new friends, and gave them an opportunity to discuss planned projects in the area. Feedback from members of all clubs represented indicated the day was a great success and was a further step in bringing the radio clubs of central Queensland closer together.

Club members attending were:
CQ Division — Errol VK4ZHL; Lyle VK4ALD; Rob VK4TKA; Doug VK4ZDK; Clive VK4ACC; Ted VK4JTW; Gordan VK4AGM; John VK4AHB and David Christmas SWL.

Biloela ARC — Don VK4ZFB and Ivan VK4QO.
Gladstone ARC — Jeff VK4JJP; Paul VK4NCD; Doug VK4ZNT; Bob VK4NUU; Jeanette VK4BZL; Vic VK4KYM; Will VK4XP; Nev VK4BPN; Noel VK4FOW; Tom VK4BNT; Nigel VK4FPC; John Jones SWL; Charlie Corbett SWL and George Phipps SWL.

—Text and photographs courtesy Nigel Stack VK4FPC, President, Gladstone ARC



From left: Jenny VK5ANW, Gordon ex-VK5GR and Paul 3B8AD, holding the "breadboard" 20 metre transmitter, loaned for the evening by the Telecommunications Museum, Adelaide.

ADELAIDE HILLS AMATEUR RADIO SOCIETY — VK5BAR

The December meeting of the Society was held as a Social Night to conclude a very active year in 1986. A group of 36 visitors and members were honoured to welcome, as Guest Speaker, Mr Gordon Ragless, a foundation member of the original Blackwood Radio Club which was formed in 1923.

Mr Ragless held the call sign, VK5GR, for many years, and members were pleased to be able to arrange a loan for the evening from the Telecommunication Museum, in Adelaide, the 20 metre transmitter made and used by Mr Ragless in the early days. This transmitter created great interest and many questions were asked by those present concerning its construction and operation.

During the evening, Mr Ragless spoke of his amateur radio experiences and his activities in the running of a 24-hour radio listening post in Adelaide, during the war-years, 1939-1945.

Among the welcome visitors to the meeting were Jenny Warrington VK5ANW, President of the WIA SA Division, Paul Caboché 3B8AD, President of the Mauritius Amateur Radio Society and Rob Gurr VK5RG, State Manager of the Department of Communications, Adelaide.

A very pleasant and informal evening was experienced, and the Society wishes to thank Mr Ragless for his most interesting talk and for his gift to the Society of the microphone case used by VK5BR (the call sign of the Blackwood Radio Club) in the early 1930s.

Members of the Adelaide Hills Amateur Radio Society are reminded that the Annual General Meeting will be held on Thursday, February 19, in the Blackwood Junior Primary School, and the election of Officer Bearers will take place to appoint the Management Committee for 1987. A full attendance is requested for this important meeting.

Inquiries concerning the activities of the Society can be made by telephoning 296 9278.

—Contributed by Gordon Welsh VK5XGS, Secretary AHARS



Forward Bias

Ken Ray VK1KEN
Box 710, Woden, ACT. 2606

ANNUAL GENERAL MEETING — 1987

The AGM for the VK1 Division will be held on Monday, February 23, in the Griffin Centre, Civic, commencing at 8 pm. As usual, elections will be held for all office bearers of the Division, and any member of the VK1 Division is eligible to nominate for any position.

Most amateurs are aware that, from time to time, the WIA comes in for criticism from members and non-members alike. For members, the best way that you ensure that the Institute is run to the best of its ability is to actively take part in the running of your own Division. While it may be easy to sit on the side and play "Devil's Advocate," or be one of the many self-styled "watchdogs," no organisation can survive without the positive, active assistance of its members. One major opportunity is at the Annual General Meeting of your Division. Don't just destructively criticise — put your money where your mouth is so to speak, and stand for a position on your Division's committee.

Alternatively, if you think something needs doing, why not speak to the committee? As well as criticism, offer solutions. Be prepared to do some work to back-up your suggestion. For example, if you think that your Division's weekly broadcast should be relayed on a band not covered at present, or re-transmitted at a different day or time, prepared to help in relays or re-broadcasts. If you think that there is an area of amateur radio not being addressed by your

Division, work out a plan to address the issue.

There is a misconception among the general amateur community that our privileges and extensions to the amateur service somehow happen magically, as a gift from the kind benefactor, the charity DOC. Some people are naive enough to believe that there is no need for any lobbying by amateurs to the Government, and that the conditions that amateurs have are an irrevocable right, akin to the constitution. The truth is far from this. There are currently around 16 000 amateur licenses on issue in Australia, compared to over 600 000 total radio communications licenses in total. This is around two and a half percent. Many of the other users of the rapidly diminishing spectrum space that are highly justifiable. If we, as an amateur fraternity are to retain our existing privileges, we need to be equally efficient and effective in our dealings with DOC, as the other spectrum users are.

While that may seem to be off the topic of the VK1 AGM, when you consider that the WIA is the group recognised by DOC as representing the interests of Australian amateurs, the future of our hobby is in your hands. If the WIA becomes ineffective and incapable of acting for its members, then amateur radio, as a hobby, has a decidedly short future. If you think that your Division — your Institute — can be a better, stronger, then do something positive to achieve that — don't just complain.

Remember, it's your hobby — and your WIA.



WICEN News

THE GREAT BIKE RIDE — 1986

The 1986 ride began in Bairsdale on Saturday, November 29, after five long train loads, plus several buses deposited over 2500 people and bikes. Their kits, with clothes, tents and camping equipment were loaded onto two large semi-trailers then were away for of bicycles, ridden by young and old (and all in between), set out for the short ride to Eagle Point Camp, on the shores of the Gippsland Lakes.

At daybreak, on Monday morning, the tranquillity of the Lakes was transformed when all packed up, breakfasted and set off, on their bicycles, along back roads en route to Sale.

These procedures were repeated each day along the route the bike ride would take, with overnight stopovers at Sale, Yarram, Foster (two-nights), Leongatha, Warragul, and Gembrook. The route was along quiet back roads through changing and very scenic country. A free day at Foster gave many riders the opportunity to ride to nearby Wilsons Promontory or into the scenic forested hills.

WICEN was involved to assist the huge organisation. Fixed stations were set up daily at starting points, plus a net control at the finishing line. Up to eight check points were set up along the route to report progress and the whereabouts of the Police Motor-bike Patrols, Doctors and St John Ambulance First Aid vehicles.

WICEN operators accompanied the doctors and first aid vehicles to enable prompt notification of any requirements. The whole organisation was constantly aware of most requirements and progress via constant communications for up to 12 hours per day.

Most communications were on two-metres through repeaters which were constantly monitored and maintained by the WIA VTAC technicians, Col Pomroy and Peter Mill.

There were no breakdowns, a small amount of interference near the suburban area, but generally 99 percent co-operation by repeater users.

A pleasing number of local Gippsland amateurs and SWLs helped with communications. Experience on a controlled net, in some cases for the first time, gave useful experience which could have future value. Food was plentiful and good supplied by the organisers. Sleep was hard to find, but an excellent spirit of happiness ran through the 3000-odd riders and support personnel.

Dennis Furlong VK3XP deserves a special commendation for his organisation of the whole WICEN operation for either the fourth or fifth year! His route maps, placing of fixed and mobile stations, arranging meals and pre-ride organisation involved much time and detailed work.

Bob Hoss VK3KAH, Co-ordinator of the Shepparton area, brought his caravan along for use as a Net Control Point. The caravan was equipped with all necessary communications, antennas, masts, etc which made the net control job easier and more efficient.

There were four Americans who had travelled from the US to ride in this year's Bike Ride.

From a family point of view, it was pleasing to see both my son and grandson involved in the ride. Son David VK3DY, was with WICEN and grandson Shannon was riding).



TS-440S

HF TRANSCEIVER



The TS-440S is an HF transceiver designed for SSB, CW, AM, FM and AFSK modes of operation on all Amateur bands including the new WARC bands. It is the ultimate in compact size with the automatic antenna tuner built-in and featuring a highly efficient final amplifier cooling system. It incorporates a 100 KHz to 30 MHz general coverage receiver having superior dynamic range. Advanced digital technology controls the various functions, including dual digital VFOs, 100 memory channels, keyboard frequency selection, memory and programmable band scan, and RIT plus XIT. Additional operating features include full break-in CW (switchable to semi break-in), built-in automatic antenna tuner, IF shift, notch filter, IF filter selection, RF attenuator, speech processor, and other features for ease of operation and added versatility.



TS-940S

HF TRANSCEIVER

The TS-940S is a competition class HF transceiver having every conceivable feature, and is designed for SSB, CW, AM, FM and FSK modes of operation on all 160 through 10 meter Amateur bands, including the new WARC bands. It incorporates an outstanding 150 KHz to 30 MHz general coverage receiver having a superior dynamic range (102 dB typical on 20 meters, 50 KHz spacing, 500 Hz CW bandwidth).

Engineered with the serious DX'er/contest operator in mind, the TS-940S features a wide range of innovative interference rejection circuits, including SSB IF slope tuning, CW VBT (Variable bandwidth tuning), IF notch filter, AF tune circuit, Narrow/Wide filter selection, CW variable pitch control, dual-mode noise blanker, and RIT plus XIT.

TL-922

HF LINEAR AMPLIFIER

The TL-922 is a band linear amplifier designed to provide maximum legal performance, utilizing two 3-500Z high performance transmitting tubes. Incorporates class AB₁ round-grid amplifier circuit. Excellent IMD (intermodulation distortion) characteristics).

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VK2 Mini-Bulletin

Tim Mills VK2ZTM
VK2 MINI BULLETIN EDITOR
Box 1066, Parramatta, NSW 2150

Members of the NSW Division are advised that the Annual General Meeting will be held on Saturday, March 28, 1987. A separate posting will be made, of the Annual Reports, in early March. You are further advised of the following dates concerning the AGM:

—Items of business and nominations from members to serve on the Council for the forthcoming year must be received at the Divisional Office, 109 Wigram Street, Parramatta, by 9 pm on Wednesday, February 25, 1987. Nomination forms are available from the Divisional Office.

—Folding and enveloping of the Annual Report and other material will occur on the evening of Tuesday, March 3, 1987, at the Divisional Office. Help is required for this task.

The Divisional Council consists of seven Full Members elected annually at the Annual General Meeting, which is by ballot, if there are more than the required number. Duties of a councillor include attendance at the monthly council meeting. In addition, each councillor has a number of administrative duties to undertake during the month, which in most cases includes attending the Parramatta Office. A full run-down on duties of a councillor is included on the nomination form.

NEW MEMBERS

The following were admitted to membership of the Division at the Council meeting on December 12, 1986.

M D Beamish VK2PEH, Putney; J C Bray VK2DEC, Faulconbridge; S R Brown Asso,

Cherrybrook; B R Croker VK2DBA, Crookwell; R N Greenstreet Assoc, Lambton; G A Hill VK2DAA, Gosford; N S Johnston Assoc, Mullumbimby; (Mrs) J M Key VK2AKW, Guildford; R A Lallor Assoc, Cambridge Park; D A Page VK2GF, Merewether; G V Povey Assoc, Bredbo; R J Richardson VK2MAO, Kempsey; R H Simmons VK2NRS, Doonside; F Yangsun Assoc, Dulwich Hill and F Delia VK2GA, Blacktown.

A warm welcome is extended to all.

To all members — we would each of you to introduce a new member to the Institute during this year. If you would like application forms sent to a prospective member, would you phone or write to the Office, (02) 689 2417, 11 am to 2 pm, Monday to Friday or 7 to 9 pm Wednesday, or call in at those times. The mailing address is to PO Box 1066, Parramatta, NSW 2150.

WICEN

The State WICEN Committee has called a meeting of the WICEN membership for Saturday, February 14, at 2 pm, to be held at 109 Wigram Street, Parramatta. A separate posting will be made to WICEN members.

The next major WICEN exercise will be the Bungonia Caving weekend — March 14/15. Advance registrations are required by mid-February. Further details via the weekly nets on repeaters 7150/8275 at 8.30 pm, Thursday, or the Sunday Broadcasts.

A reminder that the Gosford Field Day will be held at the Gosford Showground on Sunday,

February 22. There is plenty of covered areas so the event can be held in any weather.

LIBRARY

The list of publications mentioned in the notes last month have not been completed. It will appear later in the year.

The dates of the next Trash and Treasure Sale and Seminar have not yet been determined as these notes were prepared (in 1986).

The Broadcasts will give warnings of these and other coming events. If you miss hearing either of the Sunday Broadcasts, you can always check up on the major points with the Telephone News Report — Monday to Saturday on (02) 651 1489. ANARTS will recommence their VK2TTY Broadcasts on February 1.

The Sunday voice broadcasts are in need of full-call operators, in particular, for the evening sessions. If you can help, contact Dave VK2KFU, (Broadcast Office) or advise the Divisional Office.

SILENT KEY

As these notes were being completed, I learned of the passing of Dave Duff VK2EO, on December 28, 1986.

Dave was a Life Member of the Division and a Past President. He was active in the Division (to my knowledge) in the 50s and early 60s. He was involved with the establishment of VK2WL, Dural, and the selection and purchase of 14 Atchison Street. Dave served in the Navy during WWII. He was a leading CW operator on the HF bands.

—73 de Tim VK2ZTM



JOIN A NEW MEMBER

VK3 WIA Notes

Jim Linton VK3PC
IMMEDIATE PAST-PRESIDENT
WIA VICTORIAN DIVISION
412 Brunswick Street, Fitzroy, Vic. 3065

NEW MEMBERS

The following applications were received in November and accepted by Council November 27, 1986. A warm welcome is extended.

Margaret Anderson, William Bell VK3WK, P J Burke VK3PYI, Glenn Greenhall VK3KLW, Keith Irving, Linda Martin, Christopher Nihil, E M S Randall, Alan Robinson VK3SQ, Carl Schlink VK3PMH and Ernst Zimmer VK3XMQ.

We are now well into the New Year, and 1987 will be a crucial one for the future of our hobby. Take time now to reflect on where amateur radio, and the WIA, are headed in the years to come.

In Victoria, 1986 was a tough year for amateur radio with a noticeable increase in opposition to the extension of radio masts by radio amateurs. This hits at a key tenet or our hobby — the right to be a recreational activity carried out in residential dwellings. This opposition will grow unless the WIA can be an effective buffer between local government and the radio amateur.

We should all be concerned about local governments' attack on amateur radio — whether or not we personally intend to put up a mast — and see that the WIA is able to defend your fellow radio amateurs.

The sweep of change is moving across amateur radio with the DOC policy of deregulation and examination involvement.

If you care about our hobby, find the time to digest what these developments mean and give

thought to their potential impact. Let your voice be heard within the next two weeks by putting your opinions and views down on paper and sending them to the WIA Victorian Divisional Councillor, Alan Noble VK3BBM.

What hobby has changed in the past decade, but unfortunately many fail to take the broad view, or just ignore the changes around them whilst pursuing self-interests. John is clearly evident with a lack of a broad awareness of amateur radio beyond the individuals' own interests.

Change will escalate in the coming decade. It will be reflected in both the state-of-the-art facilities in commercially available equipment, and modes of emission on the amateur bands.

An understanding and appreciation of Packet Radio and its impact on the hobby is also needed — even if you are an ardent brass pounder or HF DX operator.

What about restructuring of the licensing system — this matter should concern you — but will it happen for the good of amateur radio if apathy among those already licensed prevails?

Decisions have to be made on how to accommodate change in the Amateur Radio Service. Will you participate in the decision-making process or just sit back without caring what happens? Do you really care about the future of the Wireless Institute of Australia?

The WIA Victorian Divisional Council is unable to effectively cope with its task of representing radio amateurs and shortwave listeners without a much greater input and support from the member-

ship. Because of apathy from the membership, the Victorian Division is failing in its objectives and in providing a worthwhile organisation to benefit all radio amateurs.

Very few members in recent years have contributed to the manpower and intellect resources of the Division. Those in the leadership positions on Council are unable to effectively carry out their tasks of office because they are tired and over-worked. Their willingness to put something back into the hobby by helping out with the administration of the Victorian Division is negated by councillors who do nothing, and the lack of members seeking election on council.

The amateur radio fraternity is a minority in today's society and will suffer unless it stands united and prepared to defend itself.

The WIA has, in the past, been an effective advocate for your hobby. But its strength has been cut by the lack of membership involvement. With its limited manpower, the council has made managerial changes and ensured the Division is on a sound financial footing. But it cannot give adequate attention to the challenge of change facing amateur radio when the workload rests on the shoulders of a few virtually over-worked, burnt-out councillors, acting in an honorary capacity.

The 1987-88 year could be a great one, making a lasting contribution to the hobby — but it will not if all members do not in some way help their Division and long-term harm may very well be suffered by your hobby.

Five-Eighth Wave



Jennifer Warrington VK5ANW
59 Albert Street, Clarence Gardens, SA. 5039

Well, our Jubilee year has finally come to an end, but far from fizzing out, it ended with two notable activities. Our Christmas Social on December 9, was (as many people remarked afterwards) one of the best we have had in many years. Kevin Kitto and the Glenlea Singers got us into the Christmas spirit with several brackets of bright and breezy Christmas music, and John Hampel VK5SJ, led us back through the years of radio in South Australia with his audio presentation. It was appropriate that we presented John with the ICS Award for Services to Amateur Radio, for co-ordinating the Jubilee 150 Nets throughout the year and for arranging the amateur radio involvement with the Marion Centenary celebrations. Because the ICS Award was not presented at the September Display of Members Equipment, due to a lack of entries, it was decided to present it, also, at the December meeting for services to amateur radio.

Although it is not usual for it to be given to a Council member, it was considered by the other members of Council that Rowland Bruce VK5OU, had earned some sort of recognition for his part in making the Jubilee 150 Award so successful. For those who do not know, Rowland worked out the original details of the rules and sent them off to magazines all over the world. He was involved with the design and printing, in co-operation with the South Australian Government Tourist Bureau and has since written out and arranged postage (not to mention signing by the Premier!) of over 1000 Awards. He also operated from the Faillie (a refurbished ketch), and from the Marion Library.

Not bad, when you consider he is also Federal Councillor, Vice-President and DOC Liaison Officer!

Other presentations that night included a small token of appreciation to Wendy Clegg (YF of David VK5AMK), who has organised our Christmas Social Supper for several years and our Clubs' Convention meals for the past three. We are now looking for someone to take Wendy's place in either one or both of those areas. Please let us know if you can help.

Ian Hunt VK5OX, in his role as Federal Contest Manager, presented the Contest Champion's Trophy jointly to Lindsay VK5GZ and Bob VK5BJA. It was appropriate that in his last term as Contest Manager the recipients were both VK5s. Ian pointed out that this presentation was a symbolic one with the old trophy, as two new trophies were soon to replace the old one.

Peter VK5ZPT, Jenny VK5ANW and John VK5SJ, at the Colonial Picnic. (Antique radio equipment is courtesy of Peter Thomas).

—Photograph courtesy Wendy Warrington

Despite much collusion between myself and Joan White, the YF of Neil VK5WN, we were not able to get Neil along that night to present him with an engraved pen and pencil set, in appreciation of his past services to the VK5 Division. It was only a chance remark a couple of months ago, when Neil was about to resign as the 160 metre Roster Co-ordinator (a position that he had held for over 13 years) that led me to look back into his past history with the Division. According to Marlene Austin's book, *The First 60 Years* compiled from old Council Minutes, Neil, then VK5ZAW, was on the program committee in 1957. In 1958, Neil informed Council of his intention to form a VHF group, and by 1960, had been elected to Council holding the positions of Program Organiser and VHF Representative. In 1961, he became the VHF Section Vice-Chairman. He resigned from Council around that time, but returned around 1970, when, as VK5WN, he became the Publications Officer. Later, that same year, he again took on the job of Program Organiser, and held both positions through 1971, and continued as Publications Officer through 1972. Around 1973, he was asked, at very short notice, if he could do the Sunday Morning Broadcasts from his home and he did so for the next seven weeks (an experience he remembers as somewhat nerve-wracking!). He must have got help after that because he started the 160 metre Roster, which as I said before he only relinquished a couple of months ago. Neil can still be heard every seven weeks, or so, as the 160 metre operator on the Sunday Morning Broadcast.

When I made the presentation to Neil, at his home, he protested that there are many others who have done as much, or more, for the Division. Perhaps so, but this time it was Neil that we found and it was nice to be able to say: "Thanks Neil."

Going back to the Christmas Social, we were pleased to have, as our Guests, Rob Gurr VK5RG, State Manager of DOC, and Rob's wife Margaret; and Geoff Stevens VK5ZG, DOC Liaison Officer with the WIA, and Geoff's wife Karen.

Sunday, December 28, Proclamation Day, provided us with the last chance to publicly wave our Jubilee flag — and wave it we did! For those who may not know, South Australia was proclaimed a State on December 28, 1836, under a large gum tree, in the seaside suburb of Glenelg, where Governor John Hindmarsh first stepped ashore. Every year since, a Proclamation Day Message is read at a ceremony at the same site, with the original gum tree (now more cement and fibreglass than wood!) not quite standing, but forming a picturesque arch. So, when, earlier in the year, Ken Westerman VK5AGW, suggested that the final day of transmitting at the Old Gum

Tree site be organised by himself and other Glenelg amateurs, it seemed like a good idea. However, unfortunately when the time came, the local amateurs were all unavailable for the most part, so once again the old faithfuls came to the rescue, plus one or two others. Those that were still around when I arrived around 5 pm, included Jack V15FV, Lindsay V15OZ, Ken V15QW, Graham V15AQZ and Hans V15KGZ. My apologies to anyone who came and went before that, and thanks of course to Ken VK5AGW, for organising the loan of the Sea-Rescue Squadron Caravan.

I had spent most of that day in Rymill Park, at an Old Fashioned Picnic, to mark the end of the Jubilee. It included a procession of vintage cars, horse drawn vehicles, penny-farthing bikes, etc; also old fashioned races, games and various sorts of amusements and entertainment. There were also displays of many varied types of old fashioned equipment, including (you guessed it!) old radios.

Two of our collectors and restorers of old radios in this Division are Peter Thomas VK5ZPT and John Hampel VK5SJ. When I arrived before noon, Peter, John and Peter's brother Warren, were busily setting up a display of interesting pieces from Peter's large collection. I would like to thank Peter, most sincerely, for his efforts which caused a great deal of interest. (As it was the final match of the Davis Cup round against Sweden that day, we were not sure whether the interest was really in listening to the radios, which dated from 1918, or whether the interest was really in the tennis!). Peter even had a tape of 'historic' broadcasts, and from time to time, we were able to hear such things as a young Princess Elizabeth addressing the nation, or Prime Minister, Robert Menzies informing us that we were now at war. We were asked to get into the spirit of the occasion by dressing up in pioneer-style costumes (as radio wasn't that old, John and Peter opted for something nearer the 1920s). If anyone has old unwanted radio gear, don't throw it out, Peter or John will gladly collect it from you for restoration purposes — both are QTHR in the Call Book.

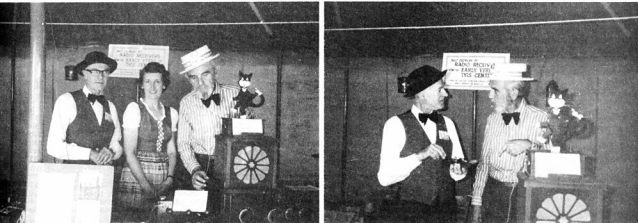
The other event of that eventful day was the operating by Bernie VK5ABG, of the VK5RAN call sign from HMAS Adelaide, and I thank Bernie for this report.

ROYAL NAVAL AMATEUR RADIO SOCIETY

On Proclamation Day, December 28, the South Australian Branch of the Royal Naval Amateur Radio Society, was given special permission to operate their club station call sign, VK5FRAN.

Peter Thomas VK5ZPT and John Hampel VK5SJ, at the Colonial Picnic.

—Photograph courtesy Wendy Warrington





WA Bulletin

Very shortly in these columns will be the notice of the forthcoming AGM which takes place in April, each year. One of the duties at the AGM is the election of the Council. In 1986, there were no nominations including no re-nominations from the sitting Council, therefore, no Council was elected and the sitting Council continued their duties under the constitution, as a caretaker Council.

We hope that the point was made. In every organisation, new blood, new ideas and new enthusiasms are required. Nearly every member of the Council have served for a number of years. Except for the ever attractive and ever young YL members, the Council consists of more mature age persons and we are asking for nominations for the next Council which must be in the Secretary's hands 42 days before the AGM. Think about it now, talk to your mates, get together and make a new Council which all of you ask for. It is no use talking about them and the old guard if you are not prepared to take their place. The Division and, indeed the Institute, can only be progressive and meaningful if we have a healthy competitive Council. Let us have a ballot for Council, make it necessary to hold one by having nominations.

Also, at the AGM, we discuss business which has been duly notified so if there is anything that you want to discuss at the AGM, whether it is a commendation for a member or a change to the

maritime mobile on board the Royal Australian Navy Frigate, HMAS Adelaide, which took part in the Proclamation Day Ceremony and Jubilee 150 Celebrations, at Glenelg.

The HMAS Adelaide was anchored one and a half kilometres off shore from Glenelg all day.

The RNARS was given permission to operate VK5RAN/MM on two metres VHF, with Ship-to-Shore communication only.

Bernie VK5ABG, was on-board from 0800 to 1700, using an FT-207R hand-held transceiver from the port-side of the bridge.

VK5RAN/MM had 56 QSOs on two metres, which included contacts with other RNARS amateurs in South Australia and with the special VJ5JA amateur station at the Old Gum Tree.

Courtesy Bernie Edwards VK5ABG, Custodian of VK5RAN & SA Representative of the RNARS Australian Branch

By the time you are reading this, you will no doubt be aware that we have a new Broadcast Producer. I would like to thank Kevin VK5IV for offering to

take over the position from Arthur VK4AAR. We hope that you will get a great amount of satisfaction and enjoyment from the job, Kevin, and to Arthur, we extend our grateful thanks for the time that you were able to fill the role. We wish you all the best in the new direction in which you are headed, Arthur.

TO THE MEMBERS OF WICEN

With the bushfire season upon us, I would like to hope that your services will not be needed, but with the thick undergrowth from our wet winter, think that may be a little optimistic. If you are called out, take care, and we thank you for volunteering yourselves and your equipment.

DIARY DATES

Tuesday, February 24, at 7.45 pm — Ray Bennett VK5RM, will speak on *New Developments in Ionospheric and Radio Wave Propagation Research*.

Fred Parsonage

Honorary Secretary

PO Box 10, West Perth, WA, 6005

constitution, get it on paper and submit it to the Secretary *Now!*

In 1987, there will be an increase in subscriptions. This is, of course, inevitable due to increasing costs, particularly in printing of the magazine AR. Your Division has endeavoured to soften this by having no increase in the Divisional portion for the fifth year running. This is possible by good housekeeping by the Treasurer, Cliff VK6LZ, Book Sales by Christine VK6ZLZ and the ever efficient QSL Bureau run by Jim VK6RU, assisted by Ray VK6NRN.

The breakdown of your subscription for 1987 is as follows:

Federal	\$12.05	a decrease of 22 cents from 1986
IARU	\$00.75	an increase of 28 cents
AR Magazine	\$14.20	an increase of \$2.44
Total Federal	\$27.00	
WA Division	\$7.00	Full Call
	\$6.00	Associate
	\$0.00	Pensioner
	\$6.00	Student

From each, 50 cents is placed in the fund for WARC 99.

This holding-down of subscriptions is, of course in reality, a true devaluation in real terms and can only be done by pruning of costs whilst maintaining a viable organisation. It is often said in commercial publications in Letters to the Editor, that the WIA only represents just over 50 percent of amateurs. This, of course, is not strictly correct and the real figures applied to active amateurs would be much higher. However, it cannot be denied that over 40 percent of licenced amateurs do not belong to the WIA, but leave the representation to those who do. This representation benefits all amateurs, whether it be to the Department of Communications, the local government bodies or to WARC, to which, as mentioned above, every member of the Division allocates 50 cents per year of their subscriptions to pay for the Institute team to represent Australian amateurs in 1999.

If amateurs want amateur radio to continue, if amateurs want their share of the frequency spectrum which is today the largest frequency allocation in the world, other than that allocated to the Armed Services, then this representation must be maintained and it can only be maintained by a strong representative membership.

So, maintain your membership and encourage others to join to enable the gains we have made to be kept for us and other who follow.

WOOLPACK/CLYDESDALE MOBILE



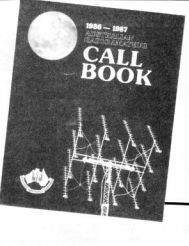
Steve Mahoney VK5AIM, operating Woolpack/Clydesdale Mobile north of Adelaide on August 27, 1986.

—Photograph courtesy Jenny Warrington VK5ANW

CHANGE OF CALL SIGN OR ADDRESS

Within days of the new Call Book being released, the Federal Office was receiving letters from amateurs that their details in the Call Book were incorrect. The WIA regularly receives updated information from the Department of Communications listing new call sign allocations and changes of call sign and address. The system works well — most of the time. Occasionally, there are delays or omissions.

All amateurs, whether they be members of the WIA or not, are requested to notify the Institute of changes of call sign or address to ensure that their entry in the Call Book is correct. When notifying the WIA of a change, please give both *old details as well as new*. If you are a member, please include a recent AR label if possible, to enable us to positively identify the record to be changed.





Over to You!

The program is written for the C-64. Further information is available from Erich Eichmann DK1TB, Kiewnringstrasse 54, D-4930, Detmold, West Germany.
Regards.

W Tomezyk VK2OE,
PO Box 1914,
Wollongong, NSW, 2500.

REUNION? ? ?

During 1987, Ray Bennett VK5RM, and myself, would like, if possible, to organise a reunion of graduates from the Marconi School of Wireless, in Melbourne, 1940-44.

The Principal of the School in those years was Cec Bardwell VK2IR. Cec guided and encouraged many young men to realise their ambition for a sea-going career. Being wartime, some were lost at sea, but no doubt we still gave a few survivors. Being so long ago, names of the graduates do not come readily to mind, but perhaps this letter may unearth some of the old salts who became radio amateurs in the post war years.

Should this letter elicit a response from those ex-ROs, or other amateurs who may have information of them, a letter to Ray or myself would be very much appreciated.

Sincerely,

Bob Clifton VK5QJ,
4 West Terrace,
Beaumont, SA, 5066.

WONDERFUL, EXCEPT FOR...

Your magazine is wonderful, except for the price per copy, which is quite high. Only well-to-do readers here can afford it — and there are not many Philippine amateurs who like reading technical articles!

Anyway, I am an amateur myself, having passed the Class "C" licence last year. However, I don't have equipment yet or a call sign. I cannot afford one in the present circumstances, so I am not active. I sat the exams as I was bored — but, what do you say? I passed!

My real hobby is actually collecting, particularly headgear from all over the world. Firstly, I get penfriends from abroad, then we exchange things such as stamps or handicrafts from the Philippines or a good ethnic hat.

I am particularly fascinated by an Australian Slouch Hat. This is my primary reason for writing to *Amateur Radio*. I would like to find some Australian penfriends for friendship and hopefully I may acquire a Slouch Hat.

Toy Liaguno, (aged 34 years),
788 Rizal Street,
Daraga, Albay 4912,
Philippines.

SET ASIDE FREQUENCIES!

In reference to December AR, I agree with VK2SR's proposal about setting aside frequencies for AM, QRP etc. For 80 metres, 3.580 MHz should be suitable. Crystals for this frequency are available for about \$3, which would encourage owners of crystal controlled equipment.

Valves seem to offer a solution. They are available from old radios and valve circuits can be simple. A one or two valve receiver can be perfectly suitable for receiving 80 metres.

It is true that AM is less efficient than SSB but, when signals are extremely strong (S9 +20 dB), it doesn't matter. As a SWL of amateur radio for two years, I have heard no AM. AM does use more band space, but often the 80 metre band is sparsely populated, eg Sunday mornings after the WIA News broadcast.

I would also like to thank the following amateurs who have helped me with advice or by QSLing my reception reports. VK2AYH, VK3BSB, VK4YA, VK5FV, VK6s SA, LC, AJ, NCO, ART, AFA, EJ, HC, VL, HD, IR, VK7s RF, KJ and VK9XZ.

73,

Peter Parker VK6NHN,
C/- PO Witchcliffe, WA, 6286.

Any opinion expressed under this heading is the individual opinion of the writer and does not necessarily coincide with that of the publisher.

LOOKING FOR A QSO!

I am a member of ORARI (the Indonesian Radio Amateur Organisation). I am interested in amateur radio QSOs abroad, especially with members of the WIA.

Thank you very much in anticipation.

Zaenal Abidin YD8ZEX,
Jalan Bosori 85,
Ternate, Maluku Utara,
Indonesia.

ANOTHER "BROADCASTING SHIP"

With reference to the paragraphs in the December issue of AR by Joe Baker, *Listening Around*, about the shortwave broadcasting station aboard the *MV Kanimbia* (9MI), there was, at this time, although it does not appear to be as well-known, a broadcasting station aboard the *MV Gwalea*. *Gwalea* was from the Union Steamship Company of New Zealand shipping line.

In a 1937 copy of an American radio magazine, there was an illustration of the ship's QSL card, which had been received by the well-known pre-war DX correspondent to various American magazines, Joe Miller.

The details appearing on the card were:

Tx — 300/400 watts
Aerial — 90 ft vertical
Rx — 16 valve double superheterodyne
Aerial — Doublet between the funnels
Freq at the time — 13.6 mcs

Reception was in New York on 13/12/36.

No details were given as to the make of the equipment, but a shrewd guess would be that it was AWA.

The call sign appearing on the card is interesting inasmuch that it is the ship's normal commercial call, ZMBJ, and not, as in the case of the *Kanimbia*, a broadcast station call sign.

Norman Burton,
130 The River Road,
Revesby, NSW, 2212.

SIMPLE SOLUTIONS SELDOM ARE!

With reference to the article in AR, December 1986, on page 50, *Technical Mailbox* — DX Polarisation Protection.

I think that the silicon diodes which are arranged in the bridge configuration as shown, will each drop approximately 0.6 volts when conducting. Since there will always be two in circuit, then 1.2 volts will be dropped, which would result in a loss of about 20 percent in power assuming a supply voltage of 12 at the bridge.

Dave Gibbons VK1GD,
PO Box 3,
Hawker, ACT, 2614.

(Quite right, Dave, As Murphy said, "Simple solutions seldom are!" — Ed)

WHY? ? ?

Why have you stopped putting the AOCPE Exam Sample Paper into *Amateur Radio* a month before the exam?

I am a Novice, 66 years old, and this Sample Exam Paper helped me a lot in study for the AOCPE exam.

Yours faithfully,

H Ehangert VK2NEH,
PO Repton, NSW, 2454.

(We are sorry to admit we have run out of approved papers. Changes in the DOC system have made it difficult to produce new papers. We would appreciate sample questions from anyone who feels competent to send some in. — Ed)

OLD TIMER

I am, what I consider, an Old Timer. Now 85 years of age, I was granted a Radio Listeners Experimental Licence from the PMG in 1923, and have a licence since that time.

I passed the AOCPE licence in 1935 and received the call sign VK2JF and have been a member of the WIA ever since.



Lloyd's QSL card.

VK2PZQ MARITIME MOBILE

I, together with a number of other amateur stations, have been following the progress of the above station during its maritime-mobile wanderings around the Pacific Islands since January 1, 1986, mainly on 3.600 MHz.

As Lloyd's journey is coming to an end, I would like, on behalf of our crew to thank the amateur fraternity for their assistance in allowing us space on the above frequency for our scheds.

Since leaving New South Wales, Lloyd's journey of 8500 kilometres has taken him to New Zealand, Fiji, Vanuatu, Loyalty Island and Noumea. We have collected call signs from all over the Pacific from stations that have assisted with relays when conditions have been unfavourable.

Thanks also go to ZLs 1AHY, 1AYE, 2BFO, and 1UT for their help and friendship.

Yours faithfully,

Paul Peacock VK2ACK,
PO Box 216,
Miranda, NSW, 2228.

—on behalf of Ted VK2CES, Bill VK2EWP, Doug VK2NNA, Ian VK2PSO, Dennis VK4NDF and all other stations who have been involved with this venture.

FEDERAL TAPES? ? ?

I recently had the opportunity to take some Call Books up to Geraldton (about 400 miles (649km) north of Perth), to sell to the amateur fraternity there, as I was making a visit to my daughter at the time.

In the process I was amazed to hear from some of the fellows that: "I see they haven't changed my old call sign to the new one yet!!"

When I inquired had they written or notified the Call Book Editor the reply was that they thought the DOC would do that!!

Do you think under the circumstances that an announcement on the Federal Tapes on Sunday's News and a printed explanation in some prominent part of the next Call Book would solve this matter?

No doubt this has been done in the past but a reminder would help to bring the information more up to date, don't you think?

Yours sincerely,

Albert Davey VK6ARD,
12 Lillian Street,
Cottesloe, WA, 6012.

(an announcement has been made on the Federal Tapes — Ed).

TO WHOM IT MAY INTEREST...

A recent letter from Walter DK8KV, informs me that he can give technical details of how to convert a Teletext 865 and Hal ST8000 to AMTOR. Readers who are interested may write for more information to: Walter Barteczek DK8KV, Wesserstrasse 3, D-5303 Boenheim 2, West Germany.

There is also a new satellite tracking program which has been developed by Erich DK1TB. Two interesting features of the program are:

— it displays on a map of the world, the actual part of the surface which is "covered" by the satellite.
— it displays the current shape of the orbit projected onto the Earth's surface.

At the age of 10, I made a telephone line stretching about a quarter of a mile to my brother-in-law's house. Over this line I could hear some Morse and faint speech, which I thought was radio but it was, in fact, induction from a railway inter-urban telephone from the railway line four miles away. Their line was parallel with my phone!

The standard Australian ship radio was 1/4 kW rotary converter run from the ship's 110 volts DC with a rotary spark gap on the end of the converter shaft. The ships receiver was one valve and an emergency transmitter was a one inch spark coil run from a battery. The backup receiver was a twin crystal (a zincite-bornite pair). I obtained a pair of these from AWA.

The crystal receiver I made received good Morse from coast stations and many ships radio from which I learned Morse code. I erected a 50 foot pair of masts and a three wire 120 foot aerial. When broadcast station 2FC commenced transmission on 11 000 metres and 3LO on 17 000, I could receive good signals at night.

At this time, I lived in the Inverell district, some 500 miles from Sydney.

I later built a one valve receiver with an AWA transformer, many stations on the 32 metre bands which were then in use (on a Pi Regenerative circuit). On this band there were Dutch stations in the Indies using ARC with frequency shift keying.

I read the article in the RAOTC column on Willis Island with great interest — the purpose of this letter — as a radio operator I knew J. Colin McGaskill, did a few tours-of-duty on Willis Island at the Meteorological Station.

Once, he started the petrol motor there which back-fired and he was badly burned. His co-operator rendered first-aid as best he could but it was quite a few days before the supply ship could transport him to Townsville due to storms.

Colin was a ship's operator, not an amateur. He was a pilot of flying boats and was seconded to the Navy in WWI. He was selected to fly, as a radio operator, on a top secret flights from Perth to Ceylon (now Sri Lanka). The plane was packed with spare petrol tanks and the radio room was only a few feet square. On the very first trip a petrol tank ruptured and the radio room was flooded, and the flight had to return to Perth.

On a later trip the crew noticed splashes on the sea water under the hull which were later discovered to be enemy bombs. They executed the trick that Sunderlands were adept with, dived down as low as they could and dodged among some little islands and sandbanks.

The enemy bombers to have shot them down, severing the only connection to India.

Willis Island is some 400 km east of Townsville and I have been told that there is some mention of automation of the instrumentation there.

During one of Colin's periods there, a flying fox stayed on the island for a few days. They were also invaded by baby turtles and had to lead them seawards by torch light.

I was born in Henham, Essex, England, in 1901.

For about 10 years I was the operator of one of our two radio receivers in the Inverell district. The other set was owned by a doctor. When told of my results by a man who had spent an evening listening to my set, the doctor commented: "Absolutely impossible. He is only getting some radiation from my aerial!"

73,

Ivan Newport VK2JF

356 Terrace Road,
Freemans Reach, NSW. 2758.

CALLING ALL SCHOOLS

As a school teacher I have decided to take some of my radio equipment to school and start a radio club for the students at Endeavour High School, in the Sydney suburb of Caringbah.

I would be interested in hearing from other amateurs/teachers who have radio equipment set-up in their schools. One idea is for contacts between different school groups before letting the students loose on normal amateurs.

Any interested can contact me on (02) 57 1426 most/evening to arrange a school or I am usually on about 3.624 MHz at 7.30 am local (2030

UTC during DST), Saturdays and Sundays.

Yours faithfully,

Peter O'Connell VK2EMU,
3A Algernon Street,
Oatley, NSW. 2223.

PIRATE OPERATORS USING VK1 PREFIX

Whilst performing the duties of Inwards QSL Manager for the VK1 call area, I have observed for some time now, the activities of pirate operators using the VK1 prefix. As I have received in excess of 200 such cards for pirate operators such as a small amateur radio population, I would like to draw readers attention to this matter in the hope that these operators will be ignored.

I realise that this action will not completely halt pirate operation, but it may draw sufficient attention to their activities to noticeably curtail them.

Two (or possibly the same operator) are consistently using the following call signs: VK1s A, B, C, D, E, AA (all official Government call signs), VK1QAV and VK1GDW. All contacts made under these calls are in the CW mode and have never been heard in the Australian Capital Territory (VK1). I have also received cards bearing the call signs, VN1A, VN1B, etc. Incidentally, there are no Australian amateur call signs with a single letter suffix. Another pirate operator is using the call, VK1ZZZ and most contacts have been made on 40 metres SSB (Australian 2-calls are not licensed to operate on the HF bands).

Another pirate operator is using the call, VK1M/M and could also be part of the former operators repertoire of bogus call signs. It would be appreciated if any amateur or SWL knowing the whereabouts of any of these operators could drop me a line with details.

As an avid DXer, I can appreciate the dismay to the sender when I am forced to return a card through the Outwards Bureau stamped 'pirate operator'. Because VK1 is a small amateur population, many overseas amateurs are listening for VK1 to complete award requirements.

John Clare VK1CJ,
GPO Box 600,
Canberra, ACT. 2601.

THIRD PARTY SOLICITING AN OPEN LETTER TO DOC

Mr Hunt
Department of Communications
Regulations and Licensing Branch
PO Box 34
Belconnen ACT 2616

Dear Mr Hunt

I write regarding the recently announced guidelines restricting the soliciting of third party radio by amateur operators.

I urge you most strongly to remove all such restrictions for the following reasons:

- 1 They are against the expressed intentions of the then Minister for Communications, Mr Staley, who, when announcing granting of third party privileges in August 1980, stated that they would be identical to the privileges enjoyed by US amateurs. There are no restrictions on soliciting in US regulations.
- 2 Such restrictions are totally unnecessary. If they are based on fears that uncontrolled soliciting will adversely affect Telecom or the OTC then please consider the following examples of such soliciting:

- a) Willoughby Park, December 1984. Several hundred members and friends of the Australian Amateur Association attended their annual picnic. Despite a high profile amateur radio display, including invitations to send messages, only seven messages came in. Bear in mind that most people there would have at least one friend or relation in the US.
- b) 1980, Crestwood Amateur Radio Club put on a public display station inviting the public to send messages. Only 15 messages resulted.
- c) September 1983, 1984, 1985 and 1986, Willoughby Family Fun Fair run by the town

Council and the NSW Sports and Recreation service, Willoughby, Sydney — averages about 20 messages per year.

d) Festival of Sydney 1982, 1983, 1984, Hyde Park — also generated about 20 messages per year.

e) The June 1981 STD telephone breakdown resulted in amateur operators which attracted only 170 messages by the principal station involved, despite excellent media coverage.

When you compare the above figures with the millions of calls handled by Telecom and the OTC every day, it is clear that soliciting by radio amateurs for third party messages is not, nor ever could be, a problem. The provision of free national and international telephone links for two Australian Traffic Net (ATN) stations during the Mexican earthquake indicates very strongly that neither Telecom or the OTC consider amateur radio a threat of any kind. It also exemplifies the excellent relationship between amateur radio and Telecom/OTC.

Example d) above has special relevance as without soliciting it would not have been the significant event in the history of public service by radio amateurs that it was.

It could be argued that it was the media who did most of the soliciting in the above example. However, the media obtained their information from radio amateurs, so who did the actual soliciting? My point is, that what represents soliciting and what does not is open to interpretation, and interpretations can change with those making them. It is altogether too fine a line to tread.

3 Without soliciting it would be harder to maintain enough traffic to keep up the interest of regular traffic operators or gain newcomers to this aspect of our hobby. We need as much practice as possible during normal times so that when emergencies do occur we have the experience, numbers, national and international links.

I cannot stress the above point strongly enough. News of the involvement of amateur radio in any emergency is soon spread, but the groundwork for that involvement is done during normal times. We need to solicit to keep up that ground work.

4 For six years now radio amateurs have operated their stations blissfully unaware of the previous restriction on soliciting, with no complaints from any potentially affected body (please correct me if I am wrong). To quote an old saying, "the proof of the pudding is in the eating". Surely, this reason alone is sufficient cause to remove all restrictions on soliciting.

5 Anyone promoting the amateur radio service as a communications aid for any non-emergency situation, be it a canoe race, a sister city event, a car rally, a marathon, etc, could be breaking the law — a ridiculous situation.

Finally, we who make continued use of our third party privileges do so on a basis of simple interest alone, but also as a means of improving the relationship between the general public and the amateur radio service on a world-wide basis, for the ultimate good of all concerned. The restrictions will hamper us in this aim.

I wish to do nothing detrimental to the excellent relationship between the DOC and the ARS, a relationship built up by people on both bodies. I just feel that any restriction on soliciting is to a degree illogical, totally unnecessary and detrimental to the public service potential of amateur radio, and therefore to amateur radio itself, and must be opposed.

I urge you, once more, to remove all restrictions on soliciting.

Yours sincerely

Signed: David Bell VK2BBT
RMB 5445
The Ridgeway
Holgate (Gosford) NSW 2250

Silent Keys

It is with deep regret we record the passing of—

MR R CARTER	VK2HC
MR G CLAY	VK2ECA
MR DAVID DUFF	VK2EO
MR J J TURZ	VK2HF
MR D M HUTCHENS	LS0527
MR B J JANSEN	VK7NJJ
MR C H JUDD	VK5HQ
MR C P LITTLEBOY	VK4PB
MR L E MALLINSON	VK4LM
MR DICK ROY	VK3ADR
MR ANGUS THORNTON	VK3IY
MR E J THORNTON	VK6BF
MR H M WATSON	VK5HW
MR G T G WHITBY	VK3ADY

Obituaries

ROBERT (Bob) V BARRINGER
VK2RR
1920 - 1986

After a long illness, Bob passed away in Hornsby Hospital on December 1, 1986, at the age of 66 years.

Bob began his life as a "Crow-eater" in 1920 and proceeded through youthful activities until May 1938, when he joined the workforce of the Adelaide Electric Supply Company, as a junior electrician and graduated through various stages until 1944. At that time, he joined the staff of Broadcast Station 5KA.

During the intervening years, Bob married Pat Cahalan, in 1943. After some years involved with broadcast techniques, Bob rejoined the AESCo (now the Electricity Trust of SA), where he became occupied with power line carrier equipment for communications and control systems. Much later after moving to Sydney in 1957, Bob joined the British Automatic Telephone and Electric Co., who were subsequently incorporated with STC and later Plessey.

Bob remained with Plessey until 1976 when he joined the Electronic Engineering Department (later to become the Biomedical Engineering Department of the Royal North Shore Hospital, Sydney), where he remained until his retirement in 1985.

It was during this past period of his life that Bob was most satisfied and totally immersed himself in the day-to-day activities of the caring situation he found at the hospital. His particular qualities of quiet assurance and dedicated attitude were an example to all with whom he came in contact, both staff and patients.

In his private life, Bob was an active member with the Wahroonga Uniting Church, particularly in youth activities, and was always available, on demand, to cope with technical problems of a sound or photographic nature. There are many photographic records of a happy and fully occupied life with Pat and their daughter Jeni.

Bob became interested in amateur activities in 1968 and became licensed with the call sign VK2ZIB. His activities were primarily centred on the VHF bands and he was an ardent two metre man, particularly portable and mobile.

In 1983, Bob upgraded to VK2RR much to his and his friends' delight, as he was now able to keep in touch with them, particularly in the latter days.

Bob also pursued his professional status and was an Associate Member of the Insti-

tution of Radio and Electronic Engineers of Australia.

Even during the latter days, and periods of hospitalisation, Bob was always intensely interested in technical developments, the increase of knowledge, was always forward thinking with positive ideals and a real care for people.

For Bob there was always hope for the future. He was a real gentleman and will be remembered well by all who knew him.

Bob is survived by his wife, Pat and daughter Jennifer, to whom we extend deepest sympathy.

—Contributed by Fred Stirk VK2ABC

GORDON PEARCE VK2PGC

Gordon Pearce was born in Victoria, spent his school days in Sydney and then joined the 5th Army Troop Company, in Victoria.

He spent the war years in New Guinea and the Solomon Islands.

In 1946, together with his brother, Gordon ran an old fashioned country general store in Tawonga, near Mount Bogong, north-east Victoria.

When his children needed high school education, Gordon returned to Sydney. Because of his experience with master tradesmen in the Army, he was permitted to do his electrician's training, studying at night and working with the PMG during the day.

When Gordon became an electrician, he applied for a Field Officers position and was trained by a veteran amateur radio enthusiast Arthur Mead. At various times he has been responsible electrically and mechanically for Australia Post buildings in Canberra and the south of New South Wales.

After a severe illness, he retired at 60 years of age and became interested, first in CB radio and then amateur radio. He passed theory and Morse code at five words per minute and was still struggling with Morse at 10 WPM when he passed away in August, last year.

Gordon was always pleased to talk with other radio enthusiasts and has left a son and grandson who hope to become amateur radio men one day.

PIETER VAN LOUWERSEN VK2DBL

On November 9, 1986, Pieter Van Louwersen became a Silent Key, passing away peacefully at his home in Artarmon Road, Willoughby, NSW, after a long and gallant fight against terminal cancer. He was aged 68 years.

Pieter was born in Walscharen, Holland and served with the Netherlands Navy in World War II as a "Sparker", in the North Sea, North Atlantic Ocean, Indian Ocean, and the Pacific. He was a Chief Petty Officer Telegraphist on his discharge from the Navy at the conclusion of hostilities. He married and settled in Sydney.

Pieter became an engineer with the Sydney City Council Water Board and, upon his retirement at 60 years of age, devoted nearly all his spare time to amateur radio, particularly CW DX contacts.

He is survived by his wife Beda, and son Karl, to whom the sympathies and condolences of the many friends he made on the amateur bands, including the writer, are extended.

Pieter, although born a Hollander was a truly "Dinkum Aussie."

—Contributed by Harry Vause VK2HV (ex-VK1HV, ex-VK4HV)

GEOFF CLAY VK2ECA

It is with great sorrow that I report the death on November 28, 1986, of Geoff Clay VK2ECA, late of Cessnock, following a short period of indifferent health.

Geoff served with the Royal Australian Navy during the Pacific Campaign of World

War II. The remainder of his working life was spent as a coal miner, until a serious accident cut short his career. He took up amateur radio as a hobby only in recent years but he had a great interest in the 'sport' and was an accomplished CW operator and the recipient of many awards for DX chasing.

The funeral for Geoff Clay VK2ECA, aged 66 years, was held in Cessnock and was attended by several of his close radio amateur friends. Geoff is survived by his wife, Dorothy to whom we extend deepest sympathy.

—Contributed by Keith Howard, Secretary, Westlakes Amateur Radio Club

ALLAN HEATH VK5ZX

Allan passed away on April 14, 1986.

He was born in 1914 and very early in his life showed an interest in amateur radio — precise details of his early activities are not available, but it is believed he was first licensed in 1933.

With the prospect of war he joined the Wireless Reserve and subsequently, in 1939, served in the RAAF Signals, rising to the rank of Squadron Leader (though this was not ratified).

After the War he returned to his watchmaking and jewellery business in Adelaide, living at Brighton.

Much of his early home-brew equipment lay disused for many years until 20 years ago when his son showed an interest in radio. He then bought an NCX5 transceiver and regularly listened across the bands, occasionally having a QSO. It became his only interest in life.

As his son I recall the day of my 21st birthday, 14 years ago. My party could not begin until his tower was erected! It was a classic case of "too many chiefs!"

He was very proud of his NCX5, then state-of-the-art and kept it even after purchasing a transistorised set.

In 1981, he was presented with a Lion's Club Award for dedicated service in conjunction with the program *Hunting Lions in the Air* 1969-81. The family is presently sorting through a huge amount of correspondence associated with this Award!

In 1985, he was admitted to hospital for a short period as it became obvious that he would not be able to continue with the family business. He closed the shop on the south-end of King William Street, ending a tradition of 32 years of service to many valued customers.

His condition did not improve, as was normally to be expected. He was admitted to the Kapunda Hospital in February, 1986. After initial improvement, he deteriorated so much that an operation was never performed. He passed away just before lunch with his wife at his side.

Allan's funeral was at his home church of St Jude, Brighton, where some 150 people paid their last respects to a man who was much respected by all who knew him.

Allan is survived by his wife Joan, sons Peter, David and Christopher VK5ZZX. Also his brother, Colin VK5FX.

—Contributed by Christopher Heath VK5ZZX



Allan's shack in the dining room, approximately five years ago.

NO NEEDLES ACUPUNCTURE

A do-it-yourself acupuncture device called *Acuhealth* is being developed in Adelaide. The needle-free acupuncture uses a battery-powered hand-held unit which applies mild electrical impulses to the tension points on the skin where acupuncture needles are traditionally inserted.

Prototypes have been tested by sports medicine clinics, chiropractors, physiotherapists, acupuncturists and the general public.

TELECOM LOOKS AT WIRELESS

The use of wireless office systems to replace fixed wiring installations is being considered by Telecom.

Based on mill-watt wave frequencies, such systems have few bandwidth restrictions and are suitable for limited ranges of around 100 metres.

The Telecom Research Laboratories are investigating multiple access techniques and network architectures suited to wireless office and personal communication systems.

Cabling and associated engineering is estimated by Telecom to make up about 70 per cent of the cost of connecting a telephone and wireless may be a cheaper solution.

DOLLAR CRISIS HITS

Due to the fall in the Australian dollar value pushing the Japanese import prices up, Hitachi has closed its branches in Western Australia, South Australia and Tasmania.

Hitachi Sales Australia Pty Ltd, the wholesale distributor of Hitachi consumer goods and power tools will also reduce their staff in other States.



DEADLINE

All copy for inclusion in the April 1987 issue of *Amateur Radio*, including regular columns and Hamads, must arrive at PO Box 300, Caulfield South, Vic. 3162, at the latest, by 9am, February 20, 1987.

Hamads

PLEASE NOTE: If you are advertising items FOR SALE and WANTED please write on a separate sheet of paper, and include all details: eg Name, Address, Telephone Number, on both sheets. Please write copy for your Hamad as clearly as possible. Please do not use scraps of paper.

* Please remember your STD code with telephone numbers

* Eight lines free to all WIA members. \$9.00 per 10 words minimum for non-members

* Copy in typescript, or block letters — double-spaced to Box 300, Caulfield South, Vic. 3162

* Headings may be charged at full rates

* QTH means address is correct as set out in the WIA current Call Book

Ordinary Hamads submitted from members who are deemed to be in the general electronics retail and wholesale distributive trades should be certified as referring only to private articles not being re-sold for merchandising purposes.

Conditions for commercial advertising are as follows:

* \$22.50 for four lines, plus \$2.00 per line (or part thereof)

Minimum charge — \$22.50 pre-payable

Copy is required by the Deadline as indicated below the indexes on page 1 of each issue.

TRADE ADS

AMIDON FERRIMAGNETIC CORES: Large range for all receiver and transmitter applications. For data and price list send 10x5 220mm SAGS to: RJ & US IMPORTS, Box 157, Mortdale, NSW. 2223. (No inquiries at office . . . 11 Macken Street, Oakley, Agencies at: Geoff Wood Elec-

tronics, Lane Cove, NSW. Webb Electronics, Albury, NSW. Truscott Electronics, Croydon, Vic. Wills Trading Co, Perth, W.A. Electronic Components, Fishwick, Plaza, ACT.

WANTED — ACT

CARTRIDGE — 280: for Commodore 64. Allan Stephenson, Box 2583, Woden, ACT. 2806. Ph:(062) 91 9534

ICOM-22S: or similar FM rig for mobile & packet use. Write with details of rig & price to Richard VKIUE, QTHR.

WANTED — NSW

BISCUITS FOR CH 2, 4, 8: from front bank of Philips 8&W TV tuner type C2-103-011. Answer similar to old type 3001, but mounting lugs differ. VK2AFU, QTHR. Ph:(02) 53 5774 or (047) 82 7617.

CIRCUIT DIAGRAMS OR SERVICE MANUAL: for Edystone rx, type 770R & 770U. All expenses paid for photocopying & postage. Ray Davies VK2FW, Ph:(053) 65 3410.

KENWOOD TRIO TS-930S: required in good condition. Please phone details to VK2AXR, QTHR. Ph:(02) 477 6275.

TOWER-8: ex-Army lower sections — 1, 2, or many. Also, tower up to 30-35'. VK2EMU. Ph:(02) 57 1426.

WANTED — VIC

AMATEUR RADIO MAGAZINES: April 1971; Jan, Apr, Jun, Aug, & Sep 1973; Nov 1975; Mar 1976; Jan & May 1984; Jan 1986. Please contact Tom Lee, Ph:(03) 232 7337 AH.

CIRCUITS FOR FOLLOWING: Hallcrafters SX-100 HF rx. Hallcrafters S-27D VHF/UHF rx. Will pay all costs incurred. Dick Forester VK3VU, QTHR. Ph:(053) 35 7683.

OSCILLATOR COIL: B/C for 175 kHz IF Aegis or similar. Bill Smith. Ph:(03) 20 3456.

COMMAND RX & TX METAL COVERS: for top & bottom, front plug in units. Will purchase incomplete sets for these components. Also, No 11 wireless set jumper leads & No 19 SP6, 101 sets & Command rx plugs. VK3AOB, Ph:(03) 337 4902.

WANTED — QLD

CIRCUIT DIAGRAM: for AWA Cathode Ray Oscilloscope, Type R6673 Ser No 108. Unit is WWII vintage & ray tube approx 5 cm across. VK455, 35 Whynt Street, West End, Qld. 4104. Ph:(07) 844 6526.

KYOKUTO 2025A: FM 2m tx/rx. Norm VK2ENT4, Ph:(07) 208 4570.

FOR SALE — NSW

COLLINS STATION: suit collector, mint condition. KWM2A & 516P2, one of the last of this famous range. Manufactured by Rockwell Collins. Complete with 312B-5 & 30L-1 linear, plus crystal pack, noise blanker & host of spare tubes. Manuals & cables. Not cheap, but quality never is. Also Drake TR4CW with power supply & speaker, noise blanker. Hardly used. Spare tubes. \$300. Ph:(02) 547 1457.

PEARCE SIMPSON SUPER PANTHER-CB, AM & SSB, 23 ch in excellent condition. With power mic, including mod details, circuit & thumb-wheel switches to convert to 12 & 10 m bands. \$260 NO. John VK2CJ, QTHR. Ph:(02) 809 5024.

YAESU FT-101B HF TCVR: includes extra VFO FV-101 and Spectronics digital display — modified. All in good order. \$300. VK2ABU, Ph:(02) 212 3933 BH or (02) 328 1261 AH.

FOR SALE — VIC

HY-GAIN AERIAL TAPE: Stainless Steel, freq range 3.5-30 MHz, portable. Rolls up and packs like surveyor's tape to 5" x 9". Perfect for travelling. Ex cond. \$150. RTTY GEAR. Tono 7000E communications computer, Tono Monitor CRT, Tono DTD Matrix Printer. Perf cond. \$1450 ONO. VK3BRE, QTHR. Ph:(055) 62 6016.

ICOM FLJ34: 10.75 MHz AM filter. Mint condition. \$80 or offer. VK3BJN, QTHR. Ph:(03) 29 3949 AH.

WINCH UP 2 SECTION GALV TELESCOPIC MAST: 14m in excel cond. All guys, etc. \$75. Alan L3094S, Ph:(03) 750 1205.

SIEWA VHF FM MON RX: 144-174 MHz with nicads & cheap. \$60. Foronphone on 1.825 MHz AM. \$45. Wills UHF FM converted to 70 cm with 4 pips & 1 simplex ch. 1140. VHF FM marine mon rx. \$25. Wills VHF converted

to 2m FM, 25 W with 8 pips & 4 simplex ch. \$150. Teleprinter Siemens M-100 with side-arms exc. \$30. M-100 w/ side-arms. \$40. Jan VK3AKY. Ph:(03) 523 9405.

YAESU FT-290R: with carton & instruction manual. Excellent condition. Includes repeater reverse mod. \$395. Tim VK3BXP. Ph:(03) 723 3943.

YAESU FT-480R: 2m all mode tx/rx. Hardly used, still in box. \$490. Kenwood TR-2400 2m FM hand-held tx/rx. As new. Still in box. \$290. Alan VK3ZCP. Ph:(054) 91 1568.

FOR SALE — QLD

ICOM IC-25H-45W, FM 2m tx/rx. Good condition with mic, bracket, manual & carton. \$425. Icom IC-22S good condition, serviced by Icom last year. \$150. Ross VK4YI, QTHR. Ph:(075) 65 1445 after 6.30 pm Qld-time.

KENWOOD TS-180S: all solid state HF tx/rx. Complete with remote VFO-180, WARC bands, digital display, speech processor, manuals, original condition, cartons, memories may be added, mic. \$750. VK4KBC, QTHR. Ph:(071) 21 5405 after 4 pm EST.

KENWOOD TS-520S-Mic, manual, original carton. \$470 ONO. Yaezu FT-200 FP-200. Like new. Spare valves & mic. \$325 ONO. VK4WR, QTHR.

KENWOOD R-5000 RX: hardly used, original carton. Best offer. Ph:(075) 32 0751.

FOR SALE — TAS

COMPUTER PROGRAMS for VZ-200/300/4 programs on 1 cassette for \$20. Log book, Morse code, Beam headings, Typing tutor. J Hirst, RSD 170, Exeter, Tas. 7251.

KENWOOD TR-3500 70 CM TCVR: 10 memories, 1.5 & 3W output, plus MS1 mobile standcharger, SMC25 speaker mic, extra battery pack, plus Tokyo Hy-Power 70 cm, 20W amplifier. Your gift at \$475. Keven VK7KV, Ph:(002) 43 8972.

FOR SALE — NT

KENWOOD TS-120V HF TCVR: PS-20 regulated power supply. SP-120 speaker, all matching units. Very good condition, with mobile mount, mic, manuals. Complete novice station. \$850. Phil VK8NPL, QTHR. Ph:(089) 80 5599 AH or (089) 80 5222 BH.

STOLEN EQUIPMENT

IC-751, Serial number 01365. Lost or stolen in transit between VK5 and VK3 by Comet.

YAESU FT-290R, Serial number 3C260713, 2m transceiver. Lost on November 12, 1986, between 12.30 and 3.30 pm. Geoff Donnelly VK2EGD.

Advertiser's Index

ANDREWS COMMUNICATION SYSTEMS	19
ATN ANTENNAS	18
AUSTRALIAN ELECTRONICS MONTHLY	18
DICK SMITH ELECTRONICS	2
ELECTRONICS TODAY INTERNATIONAL	2
EMERSONICS	4 & 49
IATRONICS	18 & 18C
IAN J TRUSCOTT'S ELECTRONIC WORLD	18
ICOM AUSTRALIA PTY LTD	21
KENWOOD ELECTRONICS AUSTRALIA PTY LTD	57
LOCUS TECHNICAL	38
TEGA ELECTRONICS	47
VICSAT	9
WIA MAGPIES	31
WIA (NSW DIVISION) NOVICE LICENCE	38
WILLIAM WILLIS & CO PTY LTD	23



SYDNEY — MELBOURNE — BRISBANE



NEW
1000 WATT TUNER
EAT — 1000A

YOU HAVE ASKED FOR IT — WE HAVE MADE IT!

This new EAT-1000/A is EMTRON'S latest antenna tuner built on special request by many amateurs. Built with finest components available, 5 position internal antenna switch, cross needle SWR/power meter, built in 4:1 balun for open feedline and antenna terminals for coax line, open feedline as well as longwire. EAT-1000A will tune almost everything from 1.8 to 30 MHz. At lowest price, professional design and quality that EMTRON provides.



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OVER 800 FAMOUS EAT-300 SOLD!!!

EMTRON'S fastest selling 300 watt antenna tuner with SWR meter, built-in 1:4 balun, heavy duty ceramic switch and top grade components. Works with all rigs and is found in Amateur, Commercial and Marine services.

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**FOR SWL EMTRON
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Antenna Tuner & Low Noise Amplifier For Receiver!

ETP-1 will match your antenna to your receiver for maximum signal from MW to SW. It utilizes a low noise 12dB gain preamplifier to boost weak signals. Special spring loaded long wire terminals as well as SO239 connectors make ETP-1 the most versatile tuner/amplifier on the market.

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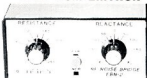
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CROSS NEEDLE RF
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Yes this new from EMTRON — highly accurate CROSS-NEEDLE SWR & POWER meter, model EP-200 with a freq range from 1.8 MHz to 60 MHz and two power ranges 20, 200 watts, gives instantaneous readings of forward/reverse power and SWR

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HF SWR
METER
EP-1**



Specially designed with PRICE, QUALITY AND ECONOMY IN MIND. Freq range from 3.50 MHz. Reads forward & reflected relative power. Ideally suited for amateur and CB services.

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Specially designed for SWL. Based on the famous "DRESSLER DESIGN", the unique electronic circuitry gives to receiver a perfect impedance match from 100kHz to 30MHz. A 12 dB low noise pre-amplifier gives weak signals a boost comes complete with 240V AC 12V DL supply and 10M of coax.

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Vic. 3000.
Entrance from Lt. Lonsdale St.)
Ph: (03) 67 8551 or 670 0330
FAX: (03) 670 0671

QUEENSLAND:

416 Logan Road, Stones Corner
Qld. 4120. TLX:144696
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New IC-R7000



Introducing a Professional Scanning Receiver
at an Affordable Price.

25-1000 MHz Plus!

frequency coverage
(no additional module required
for coverage to approx. 2.0 GHz.)

ICOM announce a scanning receiver that offers professional performance with IC-R7000 advanced technology - 25-1000MHz coverage, multi-mode operation and a sophisticated scanning and recall system.

IC-R7000 covers aircraft, marine, business, FM/AM broadcast, amateur radio, emergency services, government and television bands.

ICOM IC-R7000 has many outstanding features.

- **99 MEMORIES:** You can store up to 99 of your favourite frequencies for instant recall. Memory channels can be called up by simply pressing the memory channel knob or direct through the keyboard.
- **KEYBOARD:** Tuning can be quickly achieved by selecting precise frequencies directly through the

IC-R7000 keyboard or by turning the main tuning knob.

- **SCANNING:** Instant access is provided to commonly used frequencies through the scanning system. The Auto-M switch enables signal frequencies to be memorized while the IC-R7000 is in the scanning mode. Frequencies that were in use can be recalled at the operator's convenience. An optional voice synthesizer automatically announces the scanned signal frequency to ease problems with logging.
- **MULTI MODE:** Push button selection enables FM wide/FM narrow/AM/SSB upper and lower modes to be received.
- **6 TUNING SPEEDS:** 0.1, 1.0, 5, 10, 12.5 and 25kHz through knob selection.

- **ADVANCED TECHNOLOGY CONSTRUCTION:** The IC-R7000 has dual colour fluorescent display with memory channel readout and dimmer switch.

Dial lock, noise blanker, combined S-meter and centre meter. Optional RC-12 infra red remote control operation. All the above professional features are produced in a convenient, compact unit of size:

Height 282mm
Width 286mm
Depth 276mm

- Specifications guaranteed from 25-1000MHz and 1260-1300MHz.

No additional module is required for coverage to approximately 2000MHz. No coverage is available from 1000-1025MHz.

Please send me details on:

☐ IC-R7000 ☐ ICOM's full range of communications equipment.

Senders details:

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ADDRESS _____

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PHONE: _____ (BUSINESS) _____ (HOME)

POST TO: ICOM, 7 DUKE STREET, WINDSOR, VICTORIA, 3181. PH: (03) 529 7582.

All stated specifications are approximate and subject to change without notice or obligation. ICOM customers should be aware of equipment not purchased at authorized ICOM Australia Agents. This equipment is not covered by our parts and labour warranty.

ICOM 3355



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